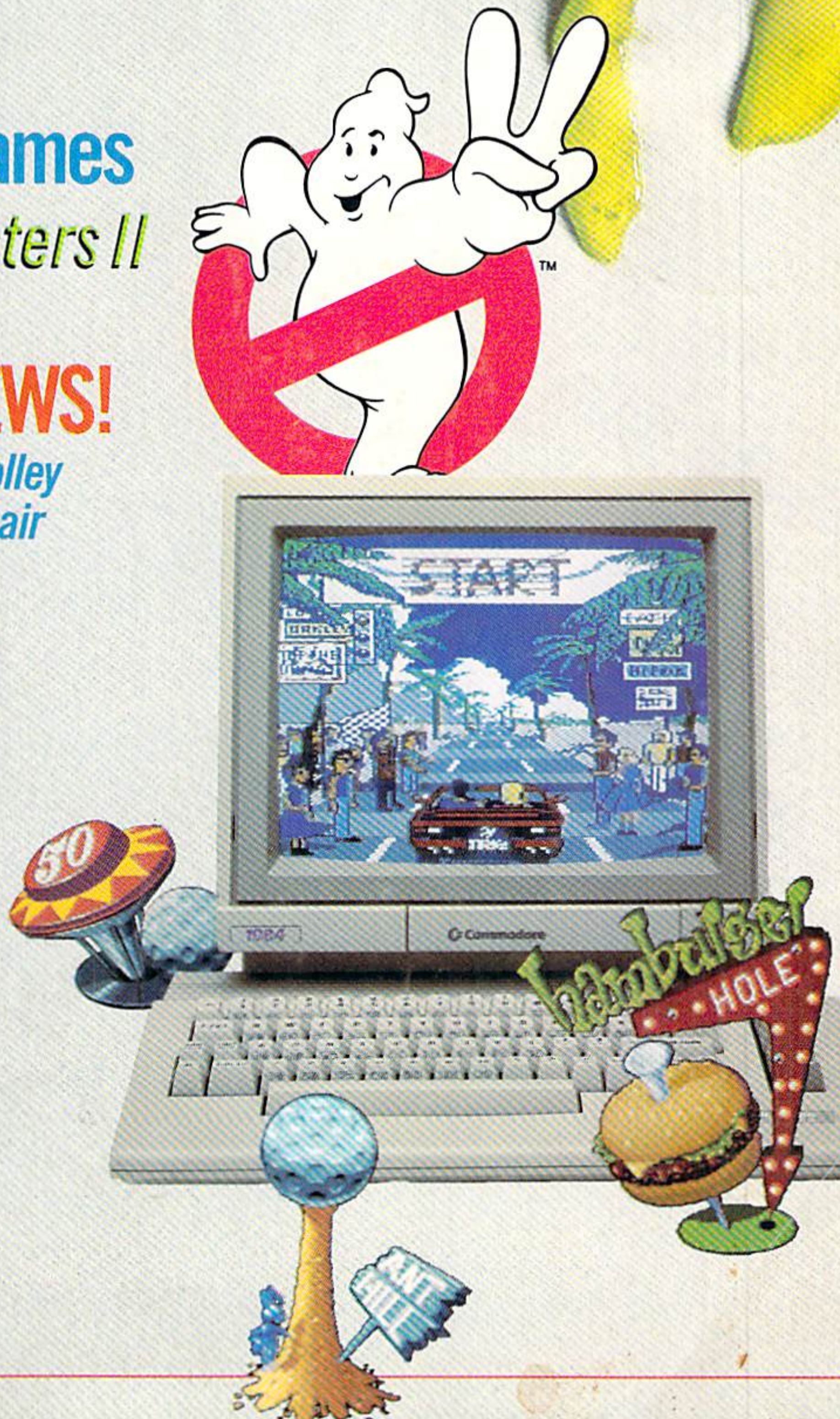
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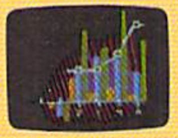
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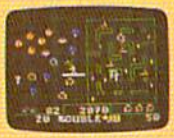
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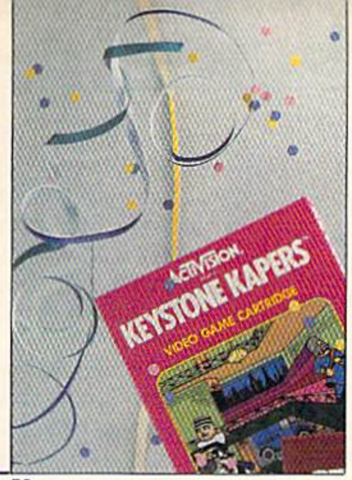
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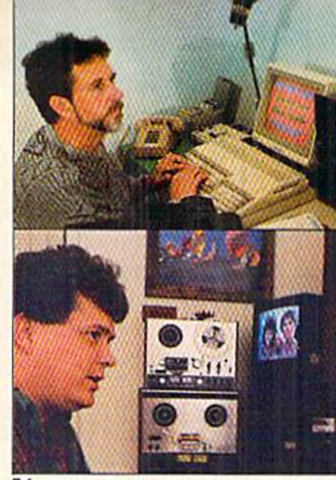
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Commodore
MAGAZINE

JULY 1989, *Volume 10, Number 7*



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FEATURES

COVER STORY

COVER PHOTO: *Charles Bartholomew*
Software: *Out Run* by Mindscape (64 version on monitor)
Zany Golf by Electronic Arts (Amiga version images)

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REVIEWS

DEPARTMENTS

Piracy Perspectives

Our feature story on software piracy ["Those Generous Pirates" by Gary Fields, April 1989] drew more mail than any article in recent memory. Our readers were quite vocal (and verbose) on the subject. Here are excerpts from some of their letters:

To the Editor:

In response to "Those Generous Pirates," I am a 16-year-old male, and I have lots of pirated games. My solution to piracy? Cut the prices down, put the games on the market faster, let people test the games before buying, and offer a trained version of a game after a while on the market. (Many hackers now "train" the games by making you invincible or [giving] unlimited lives. [This is] one of my favorite things after trying two weeks to pass a certain level on a game.)

If these things were done, I would stop pirating.

Czar
Address Unknown

Dear Editor:

I disagree totally with Mr. Fields. Pirates are not criminals!

Example: say you want to make a program that looks exactly like an already-published one, but you want to add something extra on it. You take apart the original published program and insert your extra idea. Put a new title screen on it and new music, and you have an entirely different game. Well, pirates crack the original, put hack screens on it, add trainers (unlimited lives, etc.) and sometimes change the whole title screen.

Incidentally, pirates crack originals by using copy programs such as the ones being sold in *Commodore Magazine.*

I would very much like to see a follow-up to this article. Also, if you have the nerve, publish this letter.

The Maniac
Address Unknown

***Editor's Note:** Sorry to disappoint you, but you can add all the new title screens, trainers and features you want in a game, and the resulting game will still be in violation of the copyright laws. Ask your friendly neighborhood lawyer. As a policy,* Commodore Magazine *does not accept advertising for programs that can be used to pirate software.*

To Gary Fields:

Thank you very much for the excellent article on piracy. One point that you did not mention that may also have an effect on reducing piracy is the magazine review. I have only twice in my five years of computing read anything resembling a negative review. I have the feeling that a magazine will not print negative statements for fear of losing advertising dollars.

Before I purchased a paint program for my Amiga, I actively searched out copies of the available programs and tried them. I was looking for features and ease of use. If there were bugs, I discounted them to beta factors or copy problems. I finally made a purchase and cleaned the test disks. I would much rather have just made my decision from trusted reviews.

My son runs a 128 and just got a kick out of collecting programs. He confided to me one day that he never ran any of them for more than a few minutes. He recently got sick of the whole pirating business and destroyed hundreds of disks (some purchased) and sold his system.

Again thank you for a very well-written article.

Rod Petree
Sunnyvale, CA

To Gary Fields:

The "problem" of pirating is *not* completely the pirates' fault. I remember when I got my 64, and the software was *outrageously* priced. Now if the software had been "honest price for honest work"—then there would've been no market (or very little) for cracked copies.

The quality of software has risen to phenomenal heights compared to three years ago—and yet you complain that quality software is on the way out due to piracy.

I agree that pirating for profit is wrong, but what alternatives do the software companies give? From the get-go they've had their prices sky high for programs that aren't worth the disk they're stored on! Like the guy who bought a super expensive program only to find out it never did what they claim. I've had *four* or *five* experiences like that, and I'm *sick* of these software companies taking a free ride at my expense.

I don't buy from pirates, we *share* our stuff. And I know 40 or more BBS's who have non-PD software, but you can bet your microchips I won't snitch.

L.Q.
Columbus, OH

To the Editor:

After reading Gary Fields' article, I was quite moved by its trite simplicity and its

Continued on page 86

Commodore
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Commodore Offers Amiga Solutions for Vertical Markets

Commodore Business Machines, Inc. will target the Amiga personal computer in four vertical markets, according to an announcement made at COMDEX Spring in Chicago in April. The four focus markets will be graphics, video, publishing and music.

"The Amiga provides vertical market users with a creative tool to enhance their work, without having to pay a high price," said David Archambault, director of product marketing, Commodore Business Machines, Inc.

Support for the program will include targeted advertisements in newspapers and specialty magazines, a dealer training program and customized Amiga hardware/software bundles for in-store demonstration of specific applications. Dealers will also be able to provide customers with how-to videos on the targeted applications.

To find a specialized Amiga dealer, consumers can call (800) 627-9595.

Commodore/ITTE Video Grant Program

Commodore Business Machines, Inc. and the Institute for the Transfer of Technology to Education (ITTE) have selected 20 schools to participate in a special desktop video grant program. Participants will explore and create classroom applications for video projects using the Amiga 2000HD with genlock and software provided by Commodore.

The schools were selected from over 75 proposals for classroom video projects submitted to the ITTE.

"Because of the current interest in desktop video, Commodore did not expect to have difficulty getting 20 good proposals, but we were pleasantly surprised to have gotten close to 80 innovative projects submitted," said John DiLullo, education manager, Commodore Business Machines, Inc. "We are well aware of the interest in desktop video among Amiga users, but what really surprised us was the amount of video knowledge and interest for the everyday classroom applications," he added.

Winners attended a two-day workshop in Atlanta, GA at the Omni Hotel at CNN Center. The two days of training included an official tour of the Cable News Network building.

Watch future issues of *Commodore Magazine* for updates as this program progresses.

More Hole-in-One Miniature Golf

Hole-in-One Miniature Golf from DigiTek is now available for the Commodore 64. The program includes traditional holes like the ubiquitous windmill as well as more unusual holes like one played inside a pinball machine. **Hole-in-One Miniature Golf** for the Commodore 64 carries a suggested retail price of $29.95.

DigiTek has also released **Extra Course Disk #3** with 54 more holes for the Amiga version of the game. (The master program is available for the Amiga for $39.95.) For more information contact: DigiTek Software, 8910 N. Dale Mabry, Executive Center, Suite 37, Tampa, FL 33614. Or call: (813) 933-8023.

CompuServe Goes International

CompuServe recently announced an agreement to distribute their online information service in Europe. The expansion was made possible through an agreement with Tele Columbus of Baden, Switzerland. CompuServe will initially market and support their service in the UK and Switzerland, followed by other European countries. Combined with an earlier expansion into Japan, CompuServe expects their interconnected electronic mail service to be the world's largest international communications system when the European system is implemented this fall.

Carmen in Amigaland

Elsewhere on the international front, Broderbund is releasing **Where in the World is Carmen Sandiego?** on the Amiga. Carmen, a popular globetrotting thief, is famous for teaching fourth through ninth graders their geography lessons, but parents and teachers have also been known to get caught up in the global chase. The Amiga release has been revamped to take advantage of that machine's extensive graphic capabilities. The program comes with a copy of *The World Almanac* to help players with their research. Suggested retail price of the award-winning program is $44.95. For details on Carmen's whereabouts contact: Broderbund Software, Inc., 17 Paul Drive, San Rafael, CA 94903-2101. Or call: (415) 492-3200.

Bogus Quarterback

Central Coast Software cautions Amiga users to ignore a bogus version of their hard disk back-up program **Quarterback,** which is appearing on some BBS's. The counterfeit program known as "Quarterback 3.0" is an illegal copy of CCS's program. The current version of **Quarterback** is V2.2; CCS is currently working on V2.3, which will back up to devices that don't have a standard MountList entry. Registered users of V2.2 will be notified when the update is available. For more information contact: Central Coast Software, 424 Vista Ave., Golden, CO 80401. Phone: (303) 526-1030.

Famous Courses

Access Software has released a supplemental disk for their best-selling golf program *World Class Leader Board*. **Famous Courses of the World, Vol. 1** includes Harbour Town (SC), known as the "Pebble Beach of the East"; Sunningdale (UK), built in the Nineteenth Century; Dorado Beach (Puerto Rico), one of the world's most demanding courses; and Pine Ridge, a fictional course designed by Access, which is the most difficult in the series. The disk is

available for the Commodore 64, Amiga and MS-DOS formats at a suggested retail price of $19.95. For details contact: Access Software, 545 W. 500 South, Bountiful, UT 84010. Or call: (800) 824-2549.

Amiga Rampage

Activision has released an Amiga version of their movie-monster spoof **Rampage.** Players control a ravenous oversized critter (gorilla, lizard or wolf) on a destructive forage through 132 different cities. The monster must build stamina and gain energy from the morsels he picks up along the way. **Rampage** for the Amiga sells for $39.95. The game is also available for the 64 ($34.95) and MS-DOS machines ($39.95). For further information contact: Activision, 3885 Bohannon Dr., Menlo Park, CA 94025. Phone: (415) 329-0800.

Dungeon Quest

Image Tech has released **Dungeon Quest**, a "multisensory graphic adventure" for the Amiga. The program, a medieval battle against the forces of evil, boasts vivid graphics and digitized stereo sound and supports multitasking. **Dungeon Quest** (two-disk set) retails for $49.95. For more information contact: Image Tech, 9276 Adelphi Rd., Suite 102, Adelphi, MD 20783-2029. Phone: (301) 439-1151.

Dark Side

Cinemaware's Spotlight Software label is letting computer owners take a walk on the **Dark Side.** The new program (available in 64, Amiga and MS-DOS formats) is a 3D space adventure in which the player becomes a "mercenary of the future." Equipped with lasers, shields and a jet power pack, you must infiltrate a hostile area and disarm a weapon that is capable of destroying the universe. **Dark Side** carries a suggested retail price of $39.95 for the Amiga and MS-DOS versions and $29.95 for the Commodore 64. For details contact: Cinemaware Corp., 4165 Thousand Oaks Blvd., Westlake Village, CA 91362. Or call: (805) 495-6515.

Wizardry Essay Contest

Attention **Wizardry** Warriors! Come out of the dungeons and load up your word processors, because Sir-Tech Software, publisher of the popular series, is sponsoring an essay contest. The company wants to find out "What's Hot, What's Not" in the **Wizardry** world. "All the market research in the world won't tell us what a **Wizardry** player feels when he or she plays the game," said Brenda Garno, director of corporate communications.

Essays must be no longer than 2000 words, and must include a section on what the player would like to see in forthcoming installments of **Wizardry.** Deadline for entries is September 30, 1989. Prizes include free software, **Wizardry** jackets and other promotional items. Submit entries to: Sir-Tech Software, Inc., "Wizardry Contest," P.O. Box 245, Ogdensburg, NY 13669.

HardWired

Gold Disk has launched a subsidiary to market entertainment software and has announced the first two releases in their new line. HardWired is the company; the first two games are **Denaris** (in the shoot-'em-up genre) and **Jinks** (an arcade-style break-out game). The company will be supporting the Commodore 64, Amiga and MS-DOS formats. For more information on this new venture, contact: Gold Disk, P.O. Box 789, Streetsville, Mississauga, Ontario, Canada L5M 2C2. Phone: (416) 828-0913.



Jinks



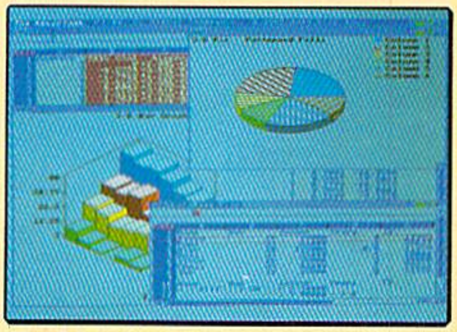
Denaris

Design 3D and The Advantage

On a more serious note, Gold Disk has released **Design 3D** and **The Advantage** for the Amiga. **Design 3D** is a modelling package suited for designers, artists, architects and engineers, as well as the home user and hobbyist. The program includes six line types and 16 colors and provides four views: top, side, front and perspective with four light sources. **Design 3D** is priced at $99.95.

The Advantage is the latest in Gold Disk's Home Office Series. The program includes a spreadsheet, database and graphics package and is designed to work on a 512K Amiga with a single disk drive. **The Advantage** can be used to create charts and graphs to be imported into *Professional Page* or *Professional Draw.* The program carries a suggested retail price of $79.95.

For further information on these releases, contact: Gold Disk, P.O. Box 789, Streetsville, Mississauga, Ontario, Canada L5M 2C2. Or call: (416) 828-0913.



The Advantage

Prospector in the Mazes of Xor

Eurosoft International has introduced **Prospector in the Mazes of Xor** in North America. In this beat-the-clock maze game, two heroes are lost in the 15 mazes of Xor and must collect 845 blue balloons to have any chance of escape. The multitasking game features a fully digitized soundtrack and is already a hit among European Amiga enthusiasts. **Prospector in the Mazes of Xor** retails for $39.95. For further information contact: Eurosoft International, 70 Woodfin Place, Suite 400, Asheville, NC 28801. Or call: (704) 255-7590.

Lattice Lowers C++ Price

Lattice, Inc. has lowered the price of their **C++** package for the Amiga from $500 to $300. According to Lattice vice-president Robert Hansen, "We set the price at a level where projected sales over the product's life span would cover development costs and provide a fair return on our investment." The product has proved more popular than the company's original projections indicated, so the savings is being passed on to customers.

Registered users can also obtain discount coupons for Lattice products. For details contact: Lattice, Inc., 2500 S. Highland Ave., Lombard, IL 60148. Or call: (312) 916-1600.

UpTime Educator Offer

UpTime, The Disk Monthly, is making a special offer to teachers and schools. Their new promotion lets educators order "Three Disks for Three Dollars." Each issue contains ten programs in Commodore 64 or MS-DOS format. The only stipulation is that the order must be made on school letterhead. For more information contact: UpTime, Box 299, Newport, RI 02840. Phone: (401) 847-2455.



Bible Search

SOGWAP Software has introduced **Bible Search** for the Commodore 64 and 128. The program contains the full text of the King James Version New Testament, plus a Concordance. The

GET MAXIMUM OUTPU

Since you've put in a few hard earned paychecks into a Commodore system, how can you be sure you'll ever get more than just a few video games out?

Well, you could start by booting up GEOS 2.0. The hard working software that's easy to use and easy on your wallet.

You see, with GEOS 2.0 you don't need to memorize complicated keyboard commands. All you need to remember is this:

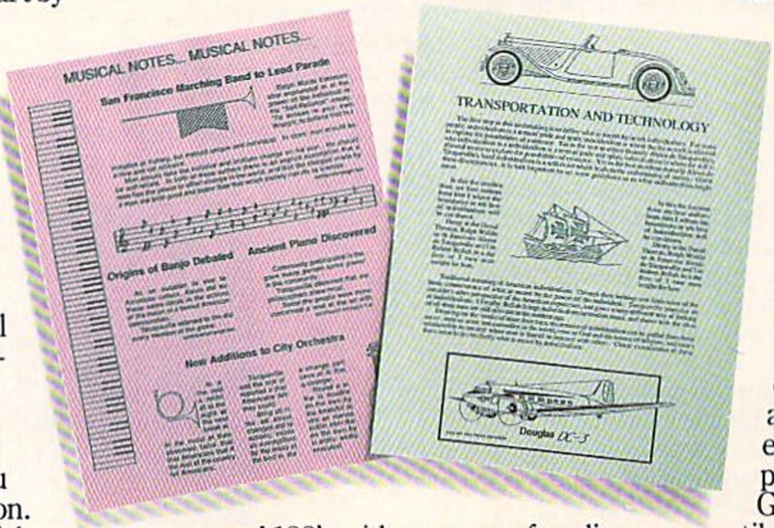
Point and click.

GEOS 2.0 shows you options, and you point to your selection. Then all you do is click your mouse or joystick.

Pretty simple, huh?

WE PUT A LOT MORE IN, SO YOU COULD GET A LOT MORE OUT.

GEOS 2.0 squeezes the absolute maximum out of Commodore 64's



and 128's with an array of applications you can use millions of ways. In fact, millions of people do.

The important thing is that with GEOS 2.0, you can create outstanding documents with outrageous graphics. That's because GEOS 2.0 includes geoWrite (an advanced, full-featured word-processor), and geoPaint, a graphic workshop with over 32 different tools and patterns.

With geoPaint, you can draw almost anything. Invert, mirror or rotate it. Then stretch and scale and save it in your GEOS 2.0 Photo Album for use later. You can mix text and graphics. Or trade them back and forth.

GEOS 2.0 even comes with its own deskTop, which lets you manage your files and disks easily and efficiently. There's a calculator, note pad and alarm clock, too. And GEOS 2.0 is LaserWriter™ compatible. Which means you get a better looking document and a harder working system that's easier to learn

program lets users quickly find and display references with single and/or multiple-word searches. The text lists complete book, chapter and verse markings. Printer output is available for any verse(s). **Bible Search** supports the Commodore 128 in 80 columns, and support disks for the 1541, 1571, 1581 drives and the 1764/1750 RAM expansion units are available. The program is available at the introductory price of $25.00 from: SOGWAP Software, 115 Bellmont Rd., Decatur, IN 46733. Phone: (219) 724-3900.

Interplay Exchange

Interplay Productions, best known for entertainment titles like *Neuromancer* and *Battle Chess* as well as the *Bard's Tale* and *Wasteland* series, has announced a new policy to benefit customers who are changing hardware. Customers who purchase Interplay games will be able to exchange their software for a version that operates on their new system.

"If one of our customers goes to the expense of buying a new computer, he shouldn't have to pay full price to replace compatible software," said Interplay president Brian Fargo. "With this policy, our customers can exchange an Interplay product at an affordable rate."

To make the exchange, customers must send their original disks, a note indicating their address and which version they'd like along with $15 for the exchange and $3.50 (s/h) to: Interplay Exchange, P.O. Box 8123, San Francisco, CA 94128-9986.

Ultima Trilogy

ORIGIN has released a collectors edition of their popular **Ultima** series for the Commodore 64. The package contains *Ultima I, II* and *III* at a special retail price of $59.95. For more information contact: ORIGIN, 136 Harvey Rd., Bldg. B, Londonderry, NH 03053. Or call: (603) 644-3360.



Commodore Business Machines wishes to thank the Clark County Commodore Computer Club of Las Vegas, NV for their help in setting up the Commodore booth for recent computer shows at the Las Vegas Convention Center. Their loyalty and support are much appreciated.

T FOR MINIMUM INPUT.

than those space alien games your cousin Phil keeps dragging home.

INCREASE YOUR OUTPUT WITH A TURBO.

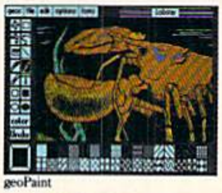
For flat out fast performance, GEOS 2.0 even comes with a diskTurbo, which cranks up your Commodore five to seven times its normal operating speed.



GEOS DeskTop

Now, if all that weren't enough, it also converts other programs' text in a heartbeat. And then checks your spelling with geoSpell. And comes with a mail merge for stamping out labels and form letters. And eleven built-in fonts. And a file manager.

The bottom line is that GEOS 2.0 can do just about anything expensive PC's can do, including



geoPaint

one thing they can't:

Share data with all our other GEOS 2.0 applications.

A HARD WORKING FAMILY.

Now, if you like the idea of what GEOS 2.0 can do by itself, just think what life would be like if you could share text, graphics and information amongst a whole family of applications.

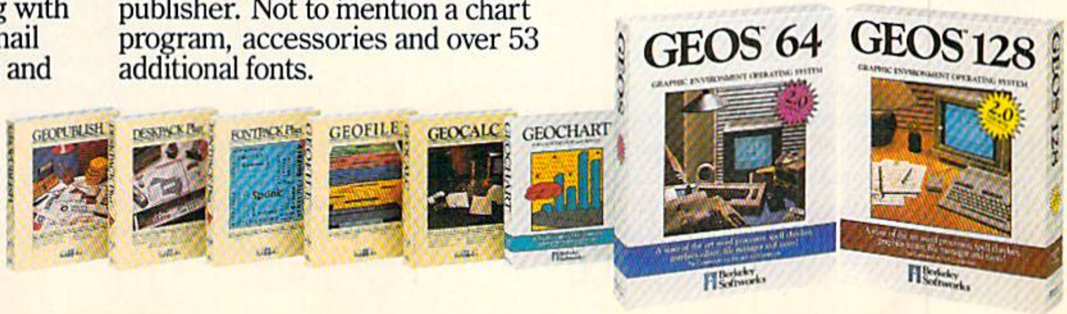
Well, that's what you get with our entire GEOS line. There's a spreadsheet, a database and a desktop publisher. Not to mention a chart program, accessories and over 53 additional fonts.

So if you'd rather take more from your Commodore and less from your wallet, insist on GEOS 2.0. For a minimal investment, it'll do more than just make your documents look a whole lot better. And that could pay out handsomely for you.

GEOS 64 2.0 $59.95 GEOS 128 2.0 $69.95
For orders only, call (800) 443-0100 ext. 234 (California residents add 7% sales tax.) $4.50 US/$8.50 foreign shipping and handling. Allow six weeks for delivery.

GEOS 2.0, GEOS 128 2.0, geoCalc, geoCalc 128, geoFile, geoFile 128, geoChart, geoPublish, diskTurbo, DeskPack *Plus* and FontPack *Plus* are copyrights of Berkeley Softworks. Commodore and LaserWriter are trademarks of companies other than Berkeley Softworks.

Berkeley Softworks
The brightest minds are working with Berkeley.



Compiled by Louis F. Sander

Lou Sander's Tips & Tricks

This month's tips feature languages, especially those not normally run on the 64 and 128. As always, we try not to neglect any interests, so we've included a few on the old standbys BASIC and machine language.

There are also some good materials on the CP/M operating system, which many of you 128 owners will appreciate, plus some goodies for joysticks and the Plus/4.

Astute observers will note the absence of programs from this month's column. That's because we're clearing the decks for next month, when the winners of our Programming Contest will appear. You may remember that the contest asked for useful programs shorter than four blocks. The entries now fill a large file box, and over the next month they'll be scrutinized, evaluated and judged.

If you have tips and/or tricks of your own to share with our thousands of readers, by all means send them in. May's column contained a Trick Writer's Guide; if you have it, use it. Even if you don't, just send your material to

Louis F. Sander
P.O. Box 101011
Pittsburgh, PA 15237

If we print your tip, you'll get a check for at least $10.

Longest Line of BASIC: In the old days, hackers would try to type the best program with as little code as possible. When fooling around with BASIC abbreviations, I came up with something that reminded me of those days.

A line typed with the Commodore BASIC abbreviations can expand to two or more lines when LISTed and the abbreviations are expanded. I think I've come up with the longest line of BASIC that can be abbreviated in 80 characters. It doesn't do anything; all it's good for is enlightenment and amusement. Here it is:

```
1 REM [76 SHFT X]
```

When typing it, don't put any spaces after the line number or between the REM and the first shifted X.

Shultz Wang
Elmhurst, NY

A Feast of Languages: While most programming for our Commodores is done in the BASIC and machine languages that are built into the computer, many other languages are available. When programming in these languages, you typically use the Commodore screen editor to prepare your program, giving it line numbers as in BASIC, but using the vocabulary and syntax of whatever language you're writing in. Your program is then processed by one or more other programs, either memory resident or on disk, to produce code you can execute and save in the second language. The program you type in is called the source code. The one prepared later is called the object code.

Here's a list of the most popular alternate languages:

Assembly language—This is a brother to machine language, since the code they produce is exactly the same. With assembly language, however, the programmer has access to many programming tools that machine language by itself lacks. All but the very simplest "machine language" programming is really done in "assembly language" with an assembler program; some people use the two terms interchangeably.

BASIC (compiled)—Commodore's built-in BASIC is a so-called "interpreted" language. That means that program statements are converted to machine language one by one each time the program is run. The various "compiled" BASICs have the familiar vocabulary and syntax, but after the program is written, it is subjected to further processing; it is compiled. This step converts the BASIC into a quasi-machine-language program which is the program you actually run. When this compiled program is executed, the computer doesn't spend time converting each statement from BASIC. Compiled BASIC is faster than the interpreted variety, but you cannot LIST the compiled program.

C—(That's not a misprint, it's the name of a language). The C language is much in vogue among professional programmers. It's a powerful language with the major advantage that its programs are transportable from one make of computer to another. C is somewhat difficult to learn, but many people think it's worth it. It's very big among Amiga programmers.

COBOL—The computer that printed your paycheck is probably programmed in COBOL, the business world's most popular language. COBOL is very effective at processing large numbers of repetitive business-type transactions; that's why it's so popular on mainframes.

COMAL—This interesting language has attracted Commodore devotees all around the world. (A more complete description appears in "COMAL Explained," below.)

FORTRAN—Here's a cousin of BASIC, with a roughly similar syntax and vocabulary. FORTRAN's great power is its ability to handle complicated mathematical calculations. It's a favorite language of scientists.

FORTH—Available in several versions, FORTH is a great language for those who like the unusual. It's highly customizable, and you program in it by defining your own new commands.

LOGO—An easy-to-learn language that has been taught in elementary schools. Its so-called "turtle graphics," in which lines are drawn by a "turtle" crawling around the screen, are popular with young programmers.

Pascal—Many colleges require their students to program in Pascal. it's a highly structured language, requiring the programmer to plan his program before he writes it. The rigid structuring makes it easy for other people to look at a program and understand it. If you're a teacher, you *like* that feature.

Modula-2—An improvement on Pascal. Easier. Lets you write your programs in modules, which are then linked together into a whole.
Mike Rivers
West Chester, PA

COMAL Explained: COMAL is an interesting programming language for the 64, 128, Amiga and PET, as well as other computers such as the Macintosh, IBM PC, IBM PS/2 and CP/M machines. It was developed in Denmark as a first language for home programmers, but has evolved to the point where it's used by professionals in many countries.

The language is similar to Pascal, C and Modula-2. Programs written on one machine can be run on any other, so long as machine-specific enhancements haven't been used. Commodore versions are available for as little as $9.95!

The U.S. branch of the COMAL Users Group publishes an 80-page newsletter (23 issues to date), and has dozens of COMAL-specific books and disks at reasonable prices.

For more information, send a self-addressed business-size envelope with two 25-cent stamps to:

COMAL Users Group, U.S.A., Ltd.
5501 Groveland Terrace
Madison, WI 53716

Louis F. Sander
Pittsburgh, PA

Compiled COMAL: The latest 64 disk-loaded version of COMAL, called Power Driver, has a compiler option. If you use the compiler, you can pass around copies of your COMAL programs without requiring users to have COMAL, or even to know that you used COMAL to write the programs.
Len Lindsay
Madison, WI

COMAL Turtle Graphics Tip: When doing turtle graphics, the drawing is much quicker if you turn off the turtle image with the HIDETURTLE command.
Captain Comal
Copenhagen, Denmark

Super C Memory Access: If you use the Commodore 64 V2 version of Super C to access memory which can be bank switched, (video chip, SID, etc.), you should do this with a machine-language routine. The Super C operating system has control of the memory map, and while it is in control of the machine, it will use memory in its own way. Your machine-language routine should first save the contents of location $0001 and then set this location to get the required map. Perform your required operations, and before exiting your routine, restore the original value to location $0001.
Jim Oldfield, Jr.
Abacus Software

Super Pascal File Safety: When you look at the directory of the Super Pascal disk, you'll notice that the names of source files have an "S" and a back-arrow as a prefix. This is not a requirement of the language, but it's a good convention to follow.

In Pascal, you're required to supply a program name in the source code; the compiler uses it as the filename under which to save the object code. If you have unwisely used that name when saving your source code, the compiler will overwrite it.
Jim D'Haem
Kentwood, MI

Learning Machine Language: For most people, machine language is harder to learn than BASIC, at least in the early stages. The problem isn't that machine language is so difficult, but that BASIC is so simple. After all, BASIC was created to make it easy to learn how to program.

The first essential step in learning machine language is to master the binary and hexadecimal numbering systems.

The next step is to learn the registers, addressing modes and instruction sets of the 6502 series of microprocessors. You can learn this from a book, but for most people it's easier to learn from a teacher. The electronics departments of community colleges and technical schools often run elementary courses in machine-language programming; computer science departments almost never do.

If you can't find a 6502-oriented course, you might want to try one for another microprocessor. Since there's some similarity among all microprocessor families, and since the hardest part of machine-language programming is to learn to think like a microchip, much of your learning will be transferable to the 65XX world.

Once you have that elementary knowledge of machine language, the next step is to work with some actual programs. [***Editor's Notes: See "ML Programming," 128 Mode, p. 62.***]
Louis F. Sander
Pittsburgh, PA

Binary and Hexadecimal: Many beginners know that computers "think" in terms of ones and zeros, and that binary math is therefore important to programmers. (Actually, computers think in terms of circuits being on or off; the ones and zeros are representations of those electrical states.)

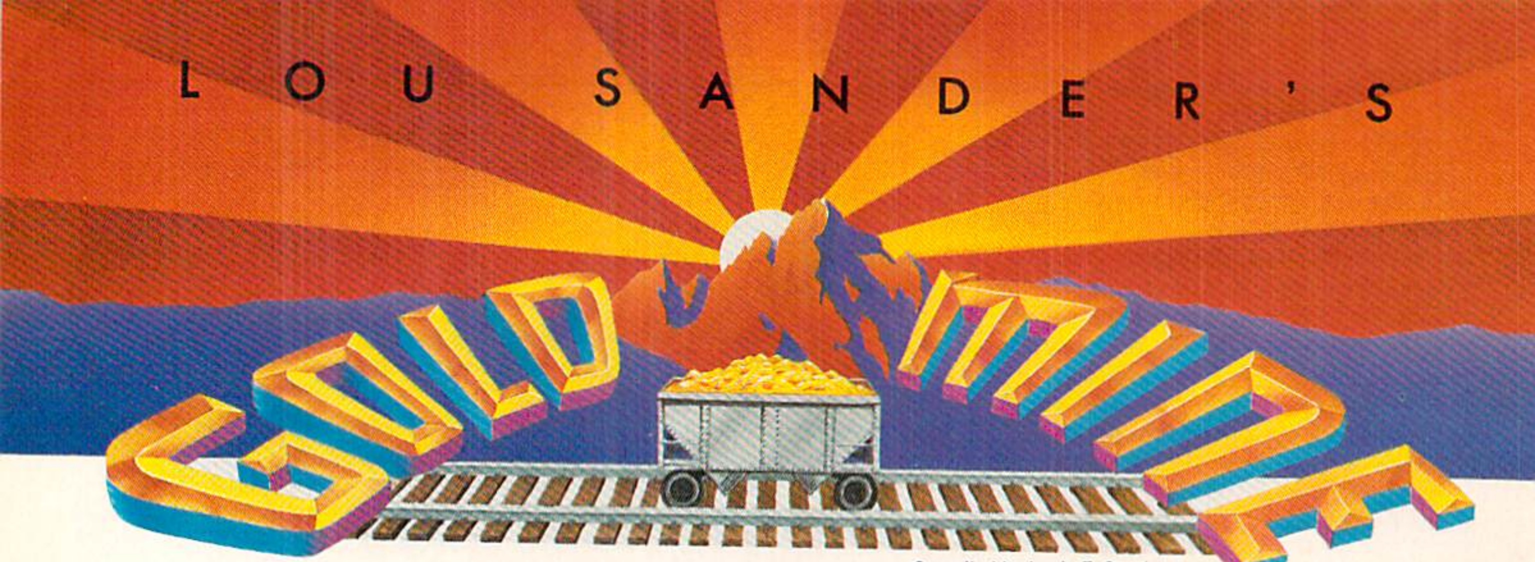
But what about hexadecimal? Who needs the additional confusion?

Actually, hex makes things simpler, not more confusing. The great benefit of hex is that it compresses a four-bit binary numeral into a hex number with a single digit. (Strictly speaking, it's a hexit, not a digit.)

Not only that, but any long binary numeral can be instantly converted to a hex numeral that's one-fourth as long. So hexadecimal is just an easy shortcut for dealing with binary.

To make the conversions, you must memorize the following table:

Continued on page 48



Compiled by Louis F. Sander

This month's nuggets are evenly divided between new games to the mine and Top 20 Favorites, with a salting of additional tips.

As always, many of our tips will work on any computer, whether it's from Commodore, Apple, Atari or IBM; others apply to only one machine.

Don't forget that many tips require skill as well as knowledge, and that since they apply to so many games and computers, we can't test every one.

Send your own Commodore game tips to:
The Gold Mine
P.O. Box 101011
Pittsburgh, PA 15237

Use a separate sheet of paper for each game, and combine all tips for one game onto one sheet. If your tip is printed, you'll get worldwide fame, a feeling of pride, and a grubstake of at least five dollars. Gold Mine Rules!

Aaargh! To beat the other monster in a fight for an egg, don't jump around and breathe fire. Just hold your ground and punch forward. After three or four falls, he will be defeated.

Keep eating, even when your monster doesn't show any wear and tear. It won't show on the screen, but your health will go way up.
Bob LaCroix
Warwick, RI

Action Biker: After loading the game, enter
POKE 15297,47
RUN
You will receive 191 motorcycles.
Jason Dishop
Huntsville, OH

Airborne Ranger: There are a few warning buzzers that the manual doesn't tell you about. In the Delayed Sabotage mission, a buzzer will sound if your bomb plant was discovered. There are two buzzers in the Create a Diversion mission: the first one tells you to start fighting, and the second tells you that you have lost due to lack of combat for a certain period of time.
Charlie Sammons
New Haven, CT

Auto Duel: If losing your prestige is no problem, you can get rich fast by getting a good payload and visiting Joe's Bar. When he gives you an offer and asks if you'll take it, hit F5 to check your payload. When you return to the regular screen, hit Y to sell the payload. If all works well, you should get the money and still have the payload!

If you're on the road with an expensive cargo that you don't want to risk losing to a road gang, find one of the places where the road doesn't make a tight fit against an obstacle. (Example: the barriers allow room to squeeze through on either side of jutting out yards.) You may lose a few points through careless driving, but no enemy cars can reach you.

Here's another way to get rich fast. Make a stripped-down vehicle with as much weight left as possible. When you've completed it, add a machine gun and leave town. When you run into another vehicle, kill it then salvage. When you return to the car, fire at the dead car once again. you should be able to continue salvaging until you're out of room.

If you're in a pinch for money, you can participate in two Amateur Nights per week, except for weeks when a championship is being held. Amateur Nights are every Saturday, plus the nights so designated on the schedule.
Contributor Unknown

The Bard's Tale I: If you're puzzled about how to get into Mangar's Tower, think back to the Sewers. The stairway that goes from the bottom level to the outside puts you behind the locked gates and right next to Mangar's Tower.
Charlie Sammons
New Haven, CT

The Bard's Tale I: If you're caught in a bind in the middle of the night, go to the Adventurers' Guild and enter it. Once inside, leave immediately. You will find yourself outside at dawn!

Always have two magic users in your party, so you can quickly develop a multi-user. (I recommend using a Magician for

this.) Meanwhile, you can develop your Archmage with a little more protection. I've never had a chance to test it, but this is probably a lot quicker than developing two Archmages at once.

If you're creating a new party of your own, make sure to use El Cid from the A-Team, since he has the Firehorn already. This will be invaluable in developing your party.
Blaine Campbell
Spruce Grove, Alberta
Canada

The Bard's Tale III: If you have a Warrior or Paladin, give him or her a Stoneblade for a weapon. Give your Thief a Heartseeker. Give your Mages Mangar's Staff. It halves the cost of spells.

In Malefia, never let large groups to ten-foot range, because they always kill everyone. The only exception is Cursed Nuisances.

Also in Malefia, go to where Tarjan is, cast DIVA once, and NUKE. Kill everything until you get 100,000 experience points. After he says "Now I will personally kill you," and you face one Tarjan, run away. Repeat this.
Seth Carlson
Silver Spring, MD

The Bard's Tale III: To get the Belt of Alliria, first find the blue, red, yellow and white rose. Also get a wineskin. Then go to the Violet Mountain and kill the Rainbow Dragon at 5S, 4E, LEV2. Get the Crystal Key and fill the wineskin with the dragon's blood. When the rainbow rose appears, get it.

Next go to 2N, 3E, LEV3 in Cyanis' Tower. Kill Cyanis. When the triangle appears, get it. Then go to 9N, 6E in Alliria's Tomb and use the triangle. A door appears to the north, and through it are stairs which you should use.

The Belt is 16N, 12E, LEV2. Use the red rose when the voice talks of kinship, the blue rose when it talks of valor, and the yellow when it talks of nature. Use the white rose with truth. Finally, give the rainbow rose to the very last voice.
Brian Spencer
Warrensburg, MO

B.C. Quest for Tires: To get across the lava, jump about an inch in front of the pit. A bird will carry you across. To get across the lake (after the lava pit), hold the fire button down to increase your speed, push up at the last second, and fly!
Joe Page
Moville, IA

Bubble Bobble: If you can get to boards 20, 30 and 40 without losing a man, a door will appear on the screen. Enter it, and you'll find a secret board filled with large diamonds.

If you get a large bullet, kill every monster on the board except one, then blow some bubbles without popping them. Kill the remaining monster and get the large diamond plus the bubbles that have turned into little diamonds.

On boards 7 and 22, wait ten seconds until the umbrella appears on the top. Take it to advance six boards.
Ashok Relwani
Flushing, NY

Bureaucracy: The order in which you collect postage stickers will be important later. Prank knocking (or ringing old ladies can sometimes pay off. In the bank, EAST and WEST can be used to move between the windows. When dealing with the Intercom, remember that only direct quotations will work.

If you've lost something, the Air Zalagasia desk is easy to find. On the Aeroplane, you can type GO TO ROW then the row number, instead of typing S a lot of times. Notice how the controls are hooked up to the wrong seats? This will help you get rid of the Stew. You need the seat in front of the angry man.

Read everything you find; a lot of the information will become useful. Some people don't read left to right or right to left.

Whatever you do, don't Panic! It is illegal without prior approval by applying in triplicate at your local llama salesman.
Tod Courtney
Centralia, IL

Captain Zapp: To fight the dragon in the jungle, run to him without stopping and shoot him every few steps. As long as you keep running at him, he will not fire back.
Jeremy Petter
Louisville, KY

Defender of the Crown: When swordfighting in a castle, always thrust and back off. Always keep your guard up.

When choosing a territory for jousting, select one closest to your opponent, not necessarily the richest one. The chances are good that the computer will take it over on its next turn.
Nick Wagner
Address Unknown

Deja Vu: To get rid of your gun, drop it in the water at the bottom of the sewer. Siegel's corpse has the key to the Mercedes.

The Sternwood Estate is at 626 Auburn Road. To read the timetable in Mrs. Vickers' drawer there, operate the pencil on it.

The syringe is in a wastebasket on the fourth floor of Joe's Bar.

You need four pieces of evidence to prove your innocence:

- Marsha Vickers' diary
- Letter in Mr. Sternwood's desk
- Timetable
- No gun (black)

Patrick Donovan
St. Foy, Quebec
Canada

Executive Leader Board: If you use a 6I on the seventh hole, you will often get a hole-in-one.
Scott Morrison
St. Catherines, Ontario
Canada

Family Feud: When you get a question, you can safely buzz in before you read it, since there isn't a time limit. With such a long time to think about your response, you're likely to come out OK.
Chad Biggerstaff
Camdenton, MO

Continued on page 94

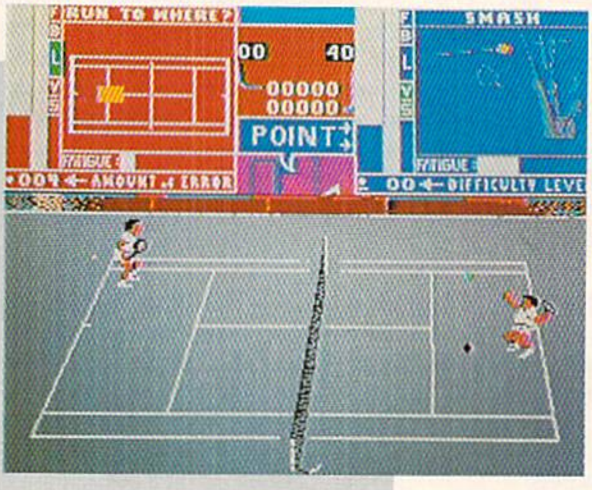
Reviewed by John Pustai

Serve & Volley

Computer: Commodore 64
Publisher: Accolade, Inc.
550 South Winchester Blvd.
Suite 200
San Jose, CA 95128
Medium: Disk
Price: $29.95

Tennis is a thinking game. Players must determine whether to smash, lob, top-spin or slice the ball, and where to place the shot. Moreover, tennis players must anticipate an opponent's return shot. Only when all of these mental decisions have been made does a player exert physical energy.

Every type of competition, level of difficulty, playing-court surface, environment and player capability is possible with *Serve & Volley.*



Almost the Real Thing

Serve & Volley demands all of the thinking of a real tennis game. The only thing missing in *Serve & Volley* is the physical exertion. Every mental decision required by a real tennis game is duplicated in this engrossing and realistic simulation. Every type of competition, level of difficulty, playing-court surface, environment and player capability is possible with *Serve & Volley.*

Before we get to the most interesting aspects of the software, it is beneficial to give a brief overview of tennis itself. Scoring for each point in any tennis game is as follows: 0 (called "love"), 15, 30, 40 and then "win." Players must "win" by two points. In other words, if the score is tied 40–40, one of the players must get two points in a row to win the game. If this doesn't occur on the next two points, the game is still tied ("deuce") until one player gets two points in a row.

A player must win six games (and beat his opponent by two games) to win a set. In the international tennis competitions seen on TV, winning a men's match occurs when one opponent wins three out of five sets. Winning a woman's match occurs when an opponent wins two out of three sets.

Serve & Volley can be played with one opponent against a computer player or with two human players challenging each other. In these two play modes, there are a couple of ways to set up the games.

First, simple match play is available. In this mode, the player determines whether to play one set or to play the best two out of three sets, or to play the best three out of five sets. Although a player must usually win a game by two points, *Serve & Volley* limits the game to one opponent beating another by a 13-to-12-point margin.

For any match play, there are different choices for the hardness of the playing surface. A "hard court" gives the ball a fast, high bounce. A "grass-court" yields a slow, long ball bounce. Finally, a "clay court" results in the ball having a longer bounce that is faster than "grass," but with less mobility.

There is even a choice of the type of court you wish to play in. "Center Court"—replete with spectators—is for those of us who daydream of becoming the next Borg, Lendl or McEnroe. "Seaside" is the choice for a more relaxing visual feast, again with surrounding fans. "Country Club" offers a private, pool-side, practice-court environment.

Players Advance

A "Tournament" option is also available to make the game appealing to neighborhood friends. In this option, up to eight players can be entered in an elimination tournament. From the initial eight players, four winners move on. Then two players move into the finals to determine the champion.

Serve & Volley comes with a list of ten existing players, and two positions for the addition of new players. The existing list has a series of statistics—number of wins and losses, percentage of wins and percentage of first serves—that ranks the players. If a new player is added to the list, and the new player continues to win games, he is advanced on the list rankings. A higher ranking on the list permits better positioning in future tournament play.

Characteristics of new players can be tailored to match actual playing ability. These characteristics include speed, endurance, forehand and backhand strength, power and accuracy. Furthermore, these characteristics affect the actual computer play during a match. Every time a player performs, the computer factors the new performance into his permanent record. Characteristics are provided for the supplied list of ten players and are used when individuals want to play as one member of this list.

Simulation Par Excellence

The most exciting feature of this software is the method by which players can make all of the mental decisions of a real tennis game. A pop-up, window—called the "Control Box"—exists for each player. In fact, there is a control box for each player—one on each side of the screen. This pop-up window does not detract from watching the players move on the field, but affords all of the decisions possible.

The control box appears when a given player must make all of the decisions. In essence, this occurs as soon as the ball is hit by the opponent. All of the mental action takes place with players using the control box to make quick decisions.

Decisions are made during the initial serve and during each volley of the game. For an initial serve, the control box offers these choices: flat shot, slice (or side-spin)

Continued on page 64

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Reviewed by John Pustai

Out Run

Computer: Commodore 64*
Publisher: Sega of America
Distributor: Mindscape
3444 Dundee Road
Northbrook, IL 60062
Medium: Disk
Price: $34.95

The object of the game is to complete each stage of the race within a 75-second time limit.



The world-famous scenic vistas that whizz by at blurring speeds make *Out Run* worth running out to buy. This high-performance, race-car adventure will take you along the beaches of southern France, the roads of the German Autobahn, the Swiss Alps, California's Death Valley and a typical French countryside. You'll move at speeds up to 295 kilometers per hour.

Choosing Your Course

Out Run is visually exciting and challenging—a result of the stellar, depth-of-field graphics. The graphical technique of slower-moving horizons—à la the Walt Disney cartoon techniques—gives a realistic sensation of true speed and movement. The sensation of speed is accomplished by having objects at different distances move laterally at different rates.

You'll save money, too. *Out Run* is based on one of the top coin-op games ever. In fact, Sega has sold over 18,000 *Out Run* arcade machines worldwide. This is an incredible feat, since most good coin-operated games average about 5000 machines sold. The reason you'll save money is that the Commodore 64 version is graphically true to the in-store video versions, so you'll spend more time at home.

The challenge comes from completing your goal—getting through five levels of a particular driving course. It is a long-distance road race. There are five different courses from which to choose. In the opening screens, you choose which course you wish to drive. To reach your goal, you'll travel over roads that are aptly named: "Cloudy Mountain," "Devil's Canyon," "Wheat Field," "Wilderness" and "Seaside Town." "Coconut Beach" will be your starting point.

During your drive, cars are constantly entering the roadway. You must pass them without crashing into them or going off the side of the road. If you get to the checkered flag of Stage 1, you automatically go right into Stage 2 without stopping. As you drive into each new stage, the number of cars increases, making the driving more challenging. Players must be much more careful about their driving capabilities as they move into another stage.

At the end of a race, a car moves along the course map to show how far you actually drove toward your chosen goal. The object of the game is to complete each stage of the race within a 75-second time limit. If you do meet this time criterion, you move on to the next stage. Time is carried over into the next driving level if it is not used up in the preceding level. An on-screen digital clock indicates how much time remains for a particular level.

Your score is based on how well and how fast you drive. In fact, the faster you drive through the course, the more points you can accumulate. In essence, you have to go as fast and as carefully as you can. If you cross the finish line in the time allotted, you'll get one million extra points for every second of time you didn't use.

Speed is increased by moving the joystick forward. If you pull back on the joystick you decelerate or brake the car to a slower speed. You are constantly moving the joystick for acceleration, deceleration, and direction. Shift from gear one to gear two by pushing the fire button. The best way to navigate curves in the roadway is to shift to the lower gear. On the screen there is an indication of what gear you are in.

The speed is indicated on screen in kilometers per hour. If you travel too fast and hit trees or objects along the side of the road, the car flips over. Excellent graphics show the car flying on its side and the occupants being thrown from the car on the ground.

Musical Interlude

You'll be musically entertained—if you so choose at the beginning of the program—by the "Magical Sound Shower" or "Splash Wave." In the opening screen before the race, there is a graphic of a radio, and the player gets to pick his choice from two types of music that will be played throughout the race. Music is chosen by moving the joystick side to side and pressing the fire button to make the choice.

On-screen graphics also indicate the stage, a relative tachometer rate, the gear you are in, your speed and your total point score. If your score is high enough to rank within the seven existing highest scores, you will be able to enter your initials on the list.

Out Run will make you concentrate on the driving. You'll be so focussed on the screen, that all else will be forgotten. Isn't that what computer fun is supposed to be? I think you'll agree, *Out Run* is worth adding to your software collection.

**Also available for the Amiga.*

Driver's Ed

- Don't slam on the brakes to avoid trouble. This will only bring the car to a dead stop, and you will lose time trying to regain momentum. Try switching to the low gear to slow down.
- Downshift to the low gear when maneuvering through a curve.
- Shift into the high gear when racing down a straightaway.
- Avoid hitting any vehicles on the road —collisions will only slow you down and eat up time.
- If you're really getting into trouble, just press the spacebar to pause, take a breath, and then get back in the race.

Reviewed by Mark Cotone

Roadwars

Computer: Commodore 64
Publisher: Arcadia/Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Medium: Disk
Price: $19.99

For your mission, you've been granted the use of a Battlesphere—a joystick-controlled street-sweeper of dynamic proportions.



If current driving annoyances like gridlock, potholes, construction delays and everyday highway congestion tend to get you a bit overheated, then let me suggest a therapeutic session with Arcadia's *Roadwars,* an arcade simulation that lets you address some potential futuristic freeway conditions behind the wheel of a Twenty-Fifth Century roadster. Take an eye-opening joyride or two across this game's blacktop, and it's a sure bet that you'll be more than happy to count your blessings and return to the more predictable present day traffic hazards. For if Arcadia's designers are right, not only are road conditions destined to get worse, they'll get downright deadly.

This contest accelerates us a few hundred years into the future, where advances in mathematical physics, cybernetics and artificial intelligence have allowed for the development of roadways so complex that they strain our late '80's imaginations. Exemplifying this fact is our stop at Armageddon, a Federation establishment displaying one of the most sophisticated travel networks ever devised.

While the planet itself remains seared, scarred and uninhabitable since the Tar'Sian War of 2371, its many life-supporting moons have recently been colonized and linked together by a magnificent series of space pathways. These computer-controlled wonderworks bridge the stellar abysses, providing easy access to all orbiting travelers. The design is an engineering marvel, garnering praise and attention from all corners of the universe. But upon your arrival a serious problem has been discovered. For no clear reason, the computer employed to monitor the numerous roadway safety mechanisms has suddenly gone haywire, destroying rather than protecting any vehicle that attempts to traverse its paths. Every level of transportation is completely shut down, bringing all of Armageddon to a dangerous standstill. The powerless frightened citizens send out a frantic call for a fast-thinking, quick-shooting hero to save the day. This is where you come in. Better fasten your seat belts, the ride will be wild.

Simply put, the object of *Roadwars* is to cruise the lunar causeways and clear them of any and all obstacles. For your mission, you've been granted the use of a Battlesphere—a joystick-controlled street-sweeper of dynamic proportions. In its attack mode, it handles like a freewheeling, streamlined two-turret tank, capable of obliterating anything in its path with an endless supply of missiles. When the situation calls for a defensive stance, a push of the fire button encases the Battlesphere in an armored shield, allowing it to plow through most obstacles with limited damage. It's a potent machine indeed, but as you'll see, your frenzied computer foe is a formidable match.

The action is viewed from a position behind and slightly above your Battlesphere. The road stretches out before you, arcing up to a vanishing point somewhere on a colorful moon hovering along the screen's upper edge. Since no one should be forced to patrol the Armageddon streets alone, this contest has been set up as a two-player challenge, with your companion's vehicle—identical to yours in design and function—fueled and positioned to your vehicle's right. If no human teammate is available for the drive, the Commodore will be glad to act as your loyal partner.

As you speed off on your journey, it won't be long before you discover the battery of fiendish traps planned for your welcome. The most common is an ironic misuse of the "protective" barriers lining each side of the road. These high-tech guard rails were originally constructed to create a magnetic field that would help to keep vehicles on their course. But by overcharging random sections of the paneled barrier, the rogue computer has transformed this retaining wall into a killer, an electronic lethal weapon that continuously launches violent sparks across the highway to destroy any unshielded vehicle in its path.

Your job is to blast away every last one of these malfunctioning panels, making travel safe for all those who follow. Clear a defined course of all sparking sections, and you and your partner will be awarded instant access to another charged thoroughfare in an even more perilous lunar precinct.

Dangerous panels differ from the unaffected ones in color, so detection is easy enough. What becomes difficult is trying to maneuver your Battlesphere into a firing position while working to avoid the additional hazards developed for your destruction. This on-road traffic includes an army of deadly small red balls that roll at you on a premeditated collision course, and stationary "Chevron" partitions, which have been placed perpendicular to the side rails to block entire lanes of traffic. Hit either of these with your shield and you lose that defense. Make contact without the shield and your Battlesphere will be reduced to rubble.

And as if that wasn't enough, in the star-speckled open space on either side of the road floats a fleet of killer satellites—the most feared of all enemies. They attack one at a time, sailing in off the horizon and honing in on your target vehicle before unleashing a powerful laser blast. They're quick to act, tough to hit and deadly accurate. In the first few rounds, a satellite visit is a rarity. But as the mission pushes on, the skies will soon be littered with these metallic marauders, helping to keep the trip interesting.

Just to show you that they do have some sympathetic capacity, the game designers have painted a few bonus arrows on the pavement. Running them over will instantly increase your firepower, provid-

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Reviewed by Scott A. May

Street Sports Football

Computer: Commodore 64
Publisher: Epyx
600 Galveston Drive
Redwood City, CA 94063
Medium: Disk
Price: $19.95

As a kid, one of my favorite sources of bumps and bruises came from a good game of backyard football. Each of us would pretend to be our favorite football heroes—Bart Starr, Jim Brown, Johnny Unitas. An imaginary line between two trees served as the end zone. There were no yard marks and no first downs. Either you scored or you punted.

Epyx recaptures these rough and tumble glory years in *Street Sports Football,* a masterful tribute to youth and vigor. The game maintains an exciting contemporary feel, while stirring nostalgic memories in those of us who admit to being thirty-something.

The game was designed by Ogdon Microdesigns and programmed by Stephen M. Thomas of K-Byte. This same team brought us *Street Sports Soccer,* without a doubt the least successful effort in the Epyx series. But don't hold it against them—this time they got it right.

I must admit football is my favorite computer diversion. So when Epyx first announced their "Street Sports" line a few years ago, I eagerly anticipated this edition. It took some time, but was worth the wait. Sporting several truly innovative play features, this game holds its own among the top contenders in the league.



Sporting several truly innovative play features, this game holds its own among the top contenders in the league.

The initial setup differs little from the three previous "Street Sports" titles. Games can be played against a computer opponent or head-to-head with a friend. Next, choose from two field locations: an urban side street or a vacant construction site. Both areas offer suitable room to play, each with its own type of field hazards (discarded bottles, cans, boxes, etc.).

Players then pick team members—three per side—from a lineup of nine neighborhood kids. Select your teams from one of the pre-saved sets on the program disk. Or let the computer create a randomly selected team for you. Serious managers will want to handpick their players, name the teams and save this combination to disk for future play. With a few exceptions, your team's eligible draftees are the same kids from the first three games in the series. Those who excelled in baseball or basketball, however, are not necessarily adept at pixel pigskin. Players assign one kid as quarterback and two as receivers. This selection is crucial to the outcome of the game. Use it to adjust skill levels and player handicaps.

Before play begins, game rules and parameters must be set. First decide how many passes must be completed for a first down (there are no yard lines). Should the offense get a first down for crossing the midfield marker? How many first downs can a team have without scoring before losing possession of the ball? Finally, determine how long the defense must count ("One Mississippi . . . Two Mississippi . . .") before rushing the quarterback. The pregame screen also allows each team to choose a playbook. This feature alone elevates *Street Sports Football* far above the average action-oriented computer football game. Playbooks consist of individual playsets, each containing up to eight detailed pass patterns. Playbooks are loaded into memory and available to each team throughout the game.

The program disk comes with its own playbook of four playsets, for a total of 24 unique patterns. The offense makes its selection before the start of each play from a menu at the bottom of the screen. Both teams may use the built-in playbook or design their own. Two sets of play diagrams are supplied with the instruction manual.

Wait a minute—design their own? Yes, included with the game is a special Playmaker option for creating custom-designed play patterns. Edit an existing pattern or start from scratch. Using on-field graphics, players can create a unique offensive formation, then assign individual running and pass patterns to each team member.

On the Playmaker screen, each player's path is represented by a different type of line (dotted, thick or thin). Patterns are drawn in the same manner as computer art programs, stretching lines in the desired direction. Each pattern can contain up to five "nodes"—changes in direction. At the end of the pattern, players can be told to Stop, Continue in that direction, or attempt to Get Open. Although there are only three players per team, the Playmaker feature suggests unlimited potential. Players can double-up, criss-cross, reverse, zig-zag, loop and hook. If you can imagine it, you can put it into play. A special option allows you to test a pattern before giving it your final stamp of approval. A blank disk is required for saving personalized plays.

The mechanics of game play are pretty straightforward. On defense, press the joystick button to switch control from one player to the next. The player under your control is highlighted. Before the ball is

Continued on page 36

Reviewed by John Pustai

Alf's First Adventure

Computer: Commodore 64
Developer: Alien Productions
Publisher: Box Office Software, Inc.
336 Robert Street, Suite 1202
St. Paul, MN 55101
Medium: Disk
Price: $15.00

Eating pizza-fuel, beating the clock, escaping dual capture and collecting treasures are activities that require focussed concentration and playing dexterity. The challenge of these activities is increased with a four-screen maze and puzzle-piece treasures that change at each of four playing levels. As a result, there are hours of fun playing with *Alf's First Adventure.*

Alf—short for "Alien Life Form"—is a proboscis-prominent, cuddly, 230-year-old, furry creature, with impeccable English, who has arrived from another planet. As the story goes, Alf was born on the planet Melmac (anyone remember those plastic dishes of yesteryear?). After rocketing through space, Alf crashes his spaceship through the earthly roof of the Tanner family garage. Unless you are also from another planet, you'll recognize that this software package was derived from the very popular television show with the same name.

Cats and Rockets

Alf's unusual personality is captured in this complex, interesting and challenging game. Alf loves pizza and cats and also wants to return home. Your job is to get Alf home. Accomplishing this task is made easy with detailed, clear, on-screen instructions that eliminate the need for a user's manual.

> Before Alf can assemble the spaceship, he must collect all the parts and return them to the garage.

All the action takes place in four game levels called "neighborhoods." These neighborhoods are really increasingly difficult, multi-screen mazes through which Alf must navigate. There are four cats,

> Your job is to get Alf home. This is made easy with detailed, clear, on-screen instructions that eliminate the need for a user's manual.

two spaceship parts and one key to collect in each neighborhood. Alf must complete all four levels before the clock reaches 24 hours.

Getting to the goal is a logical sequence of events, which goes as follows. Before Alf can assemble the spaceship, he must collect all spaceship parts and return them to the garage. But even before that, Alf must return Willie Tanner's (that's Alf's earthly host) cats to the garage. Time becomes important, because Alf cannot carry two collected items at once. Therefore, constant time-consuming forays into the neighborhood maze are needed.

Collections—of cats, spaceship parts and keys—made during these forays are indicated by an on-screen statement. Each collected item must be returned to the garage, which is in a different location for each level. Once the object is dropped in the garage, it will show up in the inventory in the garage area.

Once the four mobile cats are returned to the Tanner garage, then the four stationary spaceship parts appear at different locations in the neighborhood. Once all four boxes of spaceship parts are returned to the garage, the key will appear. The key is needed to unlock the passage to the next level.

In order to capture each cat, Alf must be well fortified with pizza—Alf's fuel. Alf's pizza level constantly diminishes—as shown graphically with a pizza that reduces by one-eighth of a pie every few seconds. When the "pizza-meter" disappears, Alf has to find and eat another pizza. Then he can continue the cat-capture activity.

While the action moves from one screen to the next, Alf is being chased by Willie Tanner and the dog catcher. If caught by Willie, Alf forfeits everything gathered from that neighborhood level and must start over at that level. If caught by the dog catcher, Alf loses one of his three lives. If Alf is caught by the dog catcher three times at any level, the game is over. There is an on-screen indication of how many Alf lives are left at a particular level.

Each neighborhood brings faster movement of the cats, Willie and the dog catcher. Willie and the dog catcher become smarter and more difficult to evade with each higher level. Therefore, Alf will have to become smarter at each level.

No Time to Waste

The challenge results from the complex action. Alf is chased by two characters. But Alf must also chase four cats, eat pizza and watch the clock tick closer to the 24-hour time limit. At the same time, Alf must return safely to the garage with each collected item.

Returning to the garage area uses up time. There is special difficulty if Willie or the dog catcher are around the garage. In this situation, Alf can only wait for Willie or the dog catcher to move to another position. Garbage cans slow up Alf's return to the garage. If Alf runs into garbage cans, he will be stunned and not move fast on the screen, making it easy to be caught.

Because of the multiple screens, the need for a pizza may force Alf closer to Willie or the dog catcher, or away from the cats, spaceship parts or key. This activity also results in a loss of time.

Several special functions have been added to the game. To quit, a player can simply press "Q." This action results in presentation of the Melmac Skleen Club listing of high-scoring players. This list shows player name, level and time for the top ten players. The list allows players to get an idea of their ability. In addition the F3 key turns the music on or off, the F1 key turns the sound on or off, and the F5 key pauses the game.

Success and failure are both abetted by clever cartoon quips. Between each neighborhood level, there is a humorous cartoon of Alf making some witty remark based on the level that is being entered. If you lose, Alf is equally "quip-tic." At one point, for example, Alf comments, "You're doing great for someone without fur."

A-L-F Spells F-U-N

The attraction of *Alf* is a combination of activities usually obtained only by owning many different software games. The graphics are excellent: the colors are bold, attractive, and eye appealing. The maze is challenging. Each level brings more challenges—spell that, F-U-N. The fun is for kids of all ages. ■

Reviewed by Russ Ceccola

Wizardry I:
Proving Grounds of the Mad Overlord

Computer: Commodore 64
Publisher: Sir-Tech Software, Inc.
P.O. Box 245
Ogdensburg, NY 13669
Medium: Disk
Price: $39.95

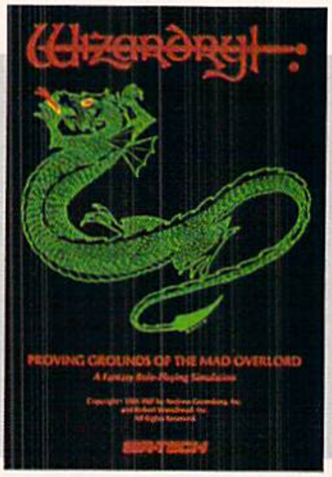
It took a long time to finally get this review written, as the editors of this fine publication can confirm. It wasn't that I had writer's block or anything—it's just that I wanted to finish *Wizardry I: Proving Grounds of the Mad Overlord* before I wrote the review. I did finish the game and compiled a list of general hints that will help you in playing the game with the minimum of frustration (see box on page 21). *Proving Grounds* is a very addictive fantasy role-playing game, and I simply wanted to play more of it rather than sit down at my Commodore 128 and write (we all know computers were designed for playing games).

But now it's time to muddle through this review. *Proving Grounds* is so addictive because it is chock full of all kinds of surprises wherever you go in the game. First off, let me tell you that if you want fancy pictures or puzzles, you better go buy another universe-on-a-disk. *Proving Grounds* is a maze game and nothing more. You create characters and place them inside a ten-level dungeon/maze in which you'll find all sorts of traps, tricks, nasties, treasure, teleporters and passageways. But before I give you the specifics of game play, let's talk about your goal.

Proving Grounds is the first scenario of the *Wizardry* series of role-playing maze games and the scenario in which you must bring a set of six characters (any fewer would be futile) up to ability levels high enough to compete in the other scenarios. *Wizardry* games have been available for other computers for many years and have become "classics" in both computer game and role-playing adventure game circles. Finally, after all those years, the classic has been translated to the Commodore 64.

This first installment in the *Wizardry* chronicles involves the Mad Overlord Trebor and the Evil Wizard Werdna. It seems that Trebor had discovered a special amulet that contained powers spoken of in fables. One day, a great fear came over him and all of his subjects. After it passed, the amulet was gone. Werdna had captured the precious item and used its powers to carve out a ten-level maze in the ground next to Trebor's castle. Paranoid that Werdna would attack again, Trebor decided to assemble an elite guard of the best characters of each class in the kingdom. The maze that Werdna created would be the "proving grounds" in which the guard would be tested. At the same time, Trebor hoped that by putting together a powerful guard, they would venture deeper and deeper into the maze until they found Werdna and recaptured the amulet. That is your goal in *Proving Grounds*—to put together a party of characters and to guide the party in the exploration of the maze in hopes of finding Werdna and the amulet.

> Your goal is to put together a party of characters and guide the party in the exploration of the maze in hopes of finding Werdna and the amulet.



Sounds neat, huh? I found it to be. I've played other maze games before, but none as packed with variety and a strong sense of exploration as *Proving Grounds*. What's more attractive about the game is that its interface is so easy to use. The *Wizardry* gaming system consists of multi-layered menus in which the options are chosen by pressing single keys. The entire game is played with the keyboard in this way. Usually, an option is selected by pressing the first letter of the name of the option, set apart from the rest of the letters by parenthesis. This makes it very easy to tell which keys can be pressed at any given time.

Wizardry makes the most of the Commodore 64's windowing capabilities. All options and messages in *Wizardry* appear in windows. Because there are so many windows, some need to be read only once and are removed from the screen in as short a time as possible without losing their effectiveness. *Wizardry* allows the user to adjust how long the windows should remain on the screen. In addition, you can interrupt the normal time delay by hitting the RUN/STOP key or turn all pauses on or off with the F1 key.

There are some other features included in *Proving Grounds* that may or may not be useful to a player. In particular, you can switch off the sounds with the F3 key and make all of the keys auto-repeating (if you hold them down) with the F5 key. The latter was very useful. Because the only sound you hear in *Wizardry* are your footsteps in the maze, I found the former option rather useless. *Proving Grounds* is the type of game that allows me to catch up on my music listening while I play because I don't need to hear any sounds to play the game.

The program autoboots on the Commodore 128, supports the 128's additional memory or a 1764 RAM Expander and uses a disk drive speed-up system that can be toggled with the F8 key if it doesn't work on your computer. These are all pluses for the game system—they are extras that can be helpful.

So far, I've avoided talking about the game play of *Proving Grounds*. That's because it is very easy to play the game, and there isn't much to it except for exploration, mapping, advancing your characters and combat. Most of your time will be spent mapping and fighting. But that's okay, because you never know what is just around the corner in *Proving Grounds*.

You create a party of up to six characters to explore the maze. The manual offers a lot of hints in this area. There are six character statistics (Strength, IQ, Pi-

ety, Vitality, Agility and Luck) that determine the character's class, five races (Humans, Elves, Dwarves, Gnomes and Hobbits), three alignments (Good, Neutral and Evil) and six classes (Fighter, Mage, Thief, Priest, Bishop, Samurai, Lord and Ninja). The first four are the basic classes; the others are advanced.

There are two main places in *Proving Grounds*—the Castle and the Maze. In the Castle, you can find Gilgamesh's Tavern, Boltac's Trading Post, The Temple of Cant and The Adventurer's Inn. At the edge of town, you can find the Training Grounds, the Maze and the Utilities. The game requires that you create your party of characters in the Training Grounds. After doing this, you outfit them with weapons, armor and other items at Boltac's. You assemble and inspect them at Gilgamesh's. You resurrect dead characters in the Temple of Cant, give rest to them in the Inn, and change names and do other things with the characters in the Utilities menu. Everything else takes place in the Maze.

A typical sitting of *Proving Grounds* involves sending your party into the maze, mapping and exploring as much of the maze as you desire, fighting monsters to collect gold and experience points and returning to the Castle to check if your characters have increased experience levels, rest them and buy any new items that you can afford. The only graphics that you see are a first-person view in the maze. It is not a solid view. The graphics are made up of simple lines. Monsters are drawn on the screen in color as you encounter them. Although simple, the graphics are effective.

The combat system is very easy to use. You select actions for each character in each round of combat, and the computer displays a message describing the result of each character's attempts. You encounter monsters frequently, but not so often that combat takes up much of your time.

Most of your efforts will be spent figuring out the layout of the maze. A pad of Map Plotting Aid paper has been included in the package—a most welcome addition. No maze level is bigger than the 20 × 20 grid on the paper, so all you have to do is fill in the grid. Choose a legend for doors, pits, transporters, etc. If you're really stuck, the mages can cast a spell that will tell you the exact coordinates of the maze that your party occupies.

Moving around the maze is accomplished by pressing one key to move forward, one key to turn left, one to turn right and one to turn around. A plus for *Proving Grounds* is that you can define these keys if you're not happy with the ones that the games uses for a default setting.

Magic is an important part of the game. In fact, you won't get very far without it. Your mages and priests can cast spells when in camp or in combat. These characters are assigned a number of spell points for each spell level (there are seven levels for both mages and priests) in which they have at least one spell written into their spell book. Each time a spell is used in a spell level, one of that level's spell points is removed. You get more spell points per level and learn more spells each time you advance an experience level. To use a spell, you just type in its name where it is required. Even the spell names were well thought-out. A more powerful spell of the same effect uses the weaker spell's name as the base word for the powerful spell's name.

With all this talk about the game's good points, there must be some flaws in *Proving Grounds*. There are two things that really bothered me. First of all, the game is incredibly slow and it accesses the disk drive too much. Even with my Commodore 128, the delays are great. Perhaps a 1764 RAM Expansion increases speed, but I really doubt it. Most of the delay comes from disk access and updates of the character data. Also, you can't save your game in *Proving Grounds*. Exploration would have been much less tedious if this option were included. The most you can do is resume where you left off, but you can't save your place and return to it when you get lost or die.

Still, *Proving Grounds* and the *Wizardry* system offers many hours of enjoyment in the quest to capture the amulet from Werdna. There are all kinds of creatures in the Maze and many neat level layouts and blind alleys to keep you occupied. My only problem now is that I have to start reviewing *Wizardry I: Knight of Diamonds* for a future issue of *Commodore Magazine*. I hope I don't get stuck, or another review might not get written for a while. Sleepless nights, here I come!

Proving Yourself

Hints for Successful Maze Maneuvering

- Think carefully about the alignment of your party before you generate characters. Characters with good alignments can't be in the same party with evil characters. If you choose a good alignment, you can't have thieves or ninjas. A neutral alignment restricts priests, bishops, lords and ninjas; an evil alignment restricts samurai and lords. You can mix good and neutral and evil and neutral.
- Be careful about changing class halfway through the game, because your statistics drop to a minimum, experience points to zero, and you lose the use of some items. However, if you know some spells in a certain level, you will eventually learn and be able to use all of the spells in that level.
- Here is the best party to have (in the standing order you should place them in the maze): Dwarf fighter, Human fighter, Gnome priest, Hobbit thief and two Elf mages.
- Remember to equip your weapon, armor, shield or any other items you need for protection before combat or entering the maze.
- Have a mage cast a DUMAPIC spell (reveal location in Maze) in camp if you are lost in the Maze.
- Plan out your initial purchases from Boltac to maximize the use of your gold pieces. Buy things for your mages and thief first, because they need the least equipment.
- Get back to the Castle as quickly as possible if one of the characters is poisoned, unless you have a high-level priest with spells to cure the poison. Otherwise, the character will die quickly.
- Use the Make Camp option to pause the game.
- When you first start out, don't take too many chances because it's too easy to get killed or lost. Make frequent trips back to the Castle to rejuvenate your characters and see if they've advanced in experience levels.
- If you haven't lost any hit points in the Maze, sleep in the stables at the Inn to see if you've advanced an experience level.
- In the very dark areas of the maze, you can't see in any direction. Be careful not to get lost.
- Check the walls to make sure that they are solid, but be careful you don't go through a one-way door and can't get back to where you were.
- As soon as your priest or bishop has the LOMILWA spell (illuminates more of the Maze and all secret doors for the duration of the expedition) or the LATUMAPIC spell (reveals the true names of all monsters for the duration of the expedition), cast them as soon as you enter the Maze.

Reviewed by John Ryan

Annals of Rome



Computer: Commodore 64
Publisher: Datasoft/PSS
Distributor: Electronic Arts
1820 Gateway Avenue
San Mateo, CA 94404
Medium: Disk
Price: $24.95

Time acts as history's veil. Things that are clear enough today, may seem oddly muddled or unimportant tomorrow. We tend to judge or test information against how current it is. Realistically, we should lend history the same ear we do the six o'clock news. However, we often see history taken for granted, or worse, shrugged off as a ritual to be endured throughout high school.

Let's look at *Annals of Rome,* a new strategy war game for the Commodore 64. Although it deals with history some 2000 years old, military historians still study the period, if only because of the lessons it taught mankind—lessons that were briefly forgotten for the duration of two world wars this century.

While *Annals of Rome* is an exercise in military strategy, it does not try to trivialize the other aspects of the empire that made ancient Rome the world city that is was. It concentrates on effective use of military power and command, while orchestrating all the other side effects of a maturing republic in the background.

The simulation roughly spans the period of history from 750 B.C. to the fall of Constantinople in 1433 A.D. (though only a select few of you will ever make it that far). Time is measured in uneven turns, where each turn may represent a chunk of time between one and 25 years, with eight turns per century. The game is further divided into seven phases.

Your window into history is comprised of a regional map, framed by tables and information critical to game play. This map is divided into 28 different regions, each with a code or number that identifies its owner. At the beginning of the game, you won't have to worry about this much, since you'll only own Italy (Italia). As the game progresses, however, the regional maps will change code references many times over as the struggle for land marches forward. The goal here, of course, is to expand Rome's borders and avoid being sacked. The further you can move Italy's frontier lands, the greater success you'll have in controlling the constant onslaught by barbarian hordes.

Before wars can be waged, however, you must have money to wage them. This is where the economic phases comes in. You may fill the imperial coffers by either conquering new lands (and holding on to them, of course) or by raising taxes. Be warned, taxing Rome's citizens, is likely to have an adverse affect on the current ruler's reign, for the current tax rate may influence local inflation, increase poverty (thereby increasing mortality rates) and cause an emperor to lose popularity. As you may know, an unpopular ruler's death grip on the throne wasn't worth a plugged drachma back in those days.

In *Annals of Rome* you should not concern yourself too much with who is the dictatorial head of Rome, since this will constantly change. In this game you are more of a conductor of events than an explicit ruler. Conversely, civil wars tend to divert attention away from more critical problems at hand (such as Gaul invasions). So raise taxes if you must, but prepare yourself for the inevitable consequences.

The next two phases deal with personnel display and assignment. There are 21 officers on hand, all of whom have varying degrees of expertise as field commanders and loyalty toward the current ruler. Also displayed are each officer's age, rank, location and identifier code. At first you'll have to assign an officer to command the legions of Rome itself. As the game progresses, you'll be able to assign commanders, legates or tribunes to outlying areas to command the Roman campaign armies and garrisons. A smart ruler will base a loyal commander in Rome to temper unrest during lean times. Unloyal commanders often stir the winds of rebellion and are best used for suicide attacks in the frontiers.

During the personnel assignment phase, a roster of Rome's officers will show the location and status of each. Since this is a game based on the movement of time, you'll see many names come and go. Some may retire, others may die in battle or from natural causes. You can assign a new officer to a region by entering a region's identifying code, then pressing the code of the officer to be assigned. When assigning personnel to a region mired in war and confusion, it's best to send a commander with high military ability. This ability is used in the formula to determine the outcome of a particular battle. On the other hand, sending an unloyal officer to a region you are about to lose is a good way to dispose of your enemies—a common method used by many Roman emperors.

An emperor's popularity is based on several factors: losing regions, an emperor's age and the tax rate, all have a variable effect on how the people of Rome view the regime. If a ruler's popularity level drops too low (on a scale of –5 to +5), a coup may be inevitable. Unloyal commanders attemping rebellion will be highlighted on your roster, though the actions you can take as ruler are fairly limited. You can try to bribe the troops in the hopes of maintaining loyalty, or appoint a new commander to Rome, this with the view that the commander will be popular enough to prevent rebellion. If these tactics do not work, Rome will be plunged into civil war.

Civil war involves a nasty chain of events that diverts resources and manpower away from the goal of maintaining Rome's borders. If the rebels win the battle over loyalist, the current leader will simply switch his loyalty to the new rebel leader! A prolonged civil war, however, may very well bring Rome to the brink of disaster, so settle all internal struggles as swiftly and painlessly as possible.

The foreign wars phase is really the heart of *Annals of Rome.* It is during this

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Reviewed by John Pustai

Win, Lose or Draw

Computer: Commodore 64
Publisher: Hi Tech Expressions
584 Broadway
New York, NY 10012
Medium: Disk
Price: $12.95

Parties will come alive with *Win, Lose or Draw.* Players will have as much fun as they do on this program's television namesake. Although this game was designed for single-player use, its potential for team and multi-user play could make *Win, Lose or Draw* the surprise hit of 1989.

If you haven't seen the TV version, here is the game strategy: There are two teams of three players each. A player tries to get his teammates to guess a secret saying, phrase or word by drawing pictures on a large pad of paper. Money is awarded to the team for each correct identification. There is also a "Speed Word Round" made up of a series of single words for teams to accumulate more money. The team with the most money at the end of the game wins.

Clever Simulation

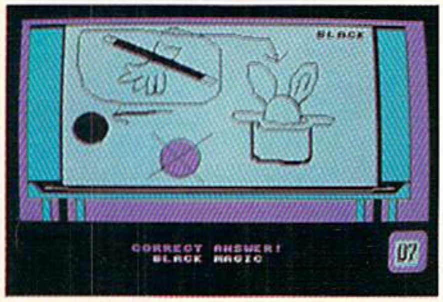
The software version is self-contained. Individuals can play against the computer, or two players can play against each other. The second side of the game disk contains the secret words, phrases and sayings and the related drawings. On-screen graphics simulate two teams with three members each.

Like its TV counterpart, the object of the software version is to guess the sentence, phrase or word being drawn to accumulate the most money. Each team gets three picture puzzles for the regular round of play, and then they play a speed round with easier puzzles for more money.

In all cases, the computer draws the pictures much like a human would draw a freehand picture. Time ticks away while the picture is being drawn, just like on the TV show. When the picture is finished, a beeping sound is made.

Returning Champs

Each time the disk is booted, players are asked if they are a returning champion. If you are a returning champion, the list will indicate the number of times you have played and the total amount of money you have won to date.



Like its TV counterpart, the object of the software game is to guess the sentence, phrase or word being drawn to accumulate the most money.

Opening graphics display a living room setting like the TV game show, with the contestants sitting on a couch and an emcee standing next to a blank drawing board. The team that is playing sits in front of the screen on the floor. The other team sits on the couch. In the lower right and left of the screen are the scores indicating how much money each team has won.

Players can choose to play as a male or female contestant. When the log-on information has been entered, players are prompted to turn the disk over to the question side. Next, players activate the drawing.

Nuts and Bolts

At any time during the drawing of the picture, the player whose turn it is can guess the answer. Answers are typed on the keyboard. If the answer is incorrect, nothing will happen, and the picture will continue to be drawn.

There is one major hint to playing the game. Players should type answers as fast as possible, as soon as they have any idea what is being drawn. For example, a puzzle solution might be "Nuts and Bolts." The computer will draw some peanuts first. If a player enters "Nuts" into the keyboard, and it is a correct portion of the answer, the word *nuts* will appear on the drawing area of the screen. Players will then know that the word *nuts* is in the complete answer.

When the complete phrase is entered correctly, the player is credited with the money. Money amounts are determined by how fast players guess the answer. More money is won if the player identifies the answer in less time. Therefore, it behooves players to type fast, with as many single words as they can think of to try to guess what is being drawn.

If the first contestant doesn't get the answer within 60 seconds, the second player has an additional 20 seconds—just like on the TV show—to make only one guess at the correct answer. If the correct answer is not given within 20 seconds, neither team wins any money.

Speed Word

The Speed Word Round is very exciting. As soon as you guess the correct speed word—even before the drawing is completed—a new drawing is started. This round lasts for 90 seconds, and the player wins money depending on how many words are guessed correctly.

Like Horseshoes, Almost

There are some cases where the computer will accept an answer that is close to the exact answer. There are also cases where the computer will not accept an answer unless it is exact. Here are some examples of answers that were not exact, and which were accepted or rejected:

Correct answer: "The moon is green cheese."
Answer accepted: "The moon is not made of green cheese."

Correct answer: "The light at the end of the tunnel."
Answer rejected: "See the light at the end of the tunnel."

Correct answer: "Blood, Sweat, and Tears"
Answer accepted: "Blood sweat and tears" (without commas)

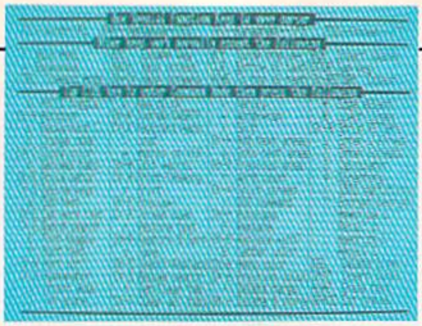
Correct answer: "Jumping the gun"
Answer accepted: "Jump the gun"

Correct answer: "Have the world by a string"
Answer rejected: "Got the world on a string"

Party Time

I tested the software at adult parties and found that even without a large-screen TV, you can still duplicate all of the

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Reviewed by Scott A. May

The Write Stuff 128

Computer: Commodore 128*
Publisher: Busy Bee Software
P.O. Box 2959
Lompoc, CA 93438
Medium: Disk
Price: $29.95
(Quick Brown Box version is also available)

Visualize your favorite, most feature-laden word processor for the Commodore 128. Now multiply that two or three times, and you'll have some idea what to expect in *The Write Stuff 128*. Prepare to be amazed.

Chances are, if you or someone you know belongs to a Commodore users group, Busy Bee Software (a.k.a. R. Eric Lee, programmer extraordinaire) is already a familiar name. Lee introduced *The Write Stuff 64* a few years ago under a new concept called "Userware": software promoted, distributed and supported entirely by users.

Enticed by demo copies of the program promoted through user groups, individuals become officially licensed distributors, placing orders directly through the company. The larger the order, the lower the price. Distributors are supplied with one master disk plus numbered disk labels, startup booklets, registration cards, manuals and keyboard overlays for the number of copies wanted.

Bypassing the costly middleman results in lower prices for commercial-quality software. The system works, which is as much a tribute to the power of Commodore users as it is to the strength of Lee's program.

The Write Stuff 128 is actually the title of the entire software package, which contains several distinct programs. The main feature is, of course, "BB Writer 128." Both 40- and 80-column versions are included on the flippy disk. With only a few exceptions, each version offers identical features.

Also included on the disk is "BB Customizer," a powerful tool for creating custom printer setups. Over 30 used-defined printer macros in addition to 16 printer toggles can be used for complete printer control. "BB Manual Maker" will print a hard copy of all 68 help files found on the disk. Finally, "BB Menu Maker" creates cursor-driven, auto-load disk directories, complete with user-defined file descriptions. You'll want to include this handy DOS accessory on all your disks.

The Write Stuff 128 is actually the title of the entire software package, which contains several distinct programs.

Given the cost/power/performance ratio of the Commodore 128, you simply can't find a better computer for word processing. Although hard-core users will agree that the *perfect* word processing software does not exist—and never will—none has ever come closer than "BB Writer 128." Yet the program is versatile enough to appeal to all users, from absolute beginners to the most demanding typesetter, and beyond.

A complete list of the program's features boggles the mind. You may never use them all, but the potential is there. Here's a sample:

- 90K of on-disk documentation, including 68 help files, 36 tutorial files, and instant on-line help screens
- 60 user-defined keyboard macros
- Built-in outline generator
- Dvorak/QWERTY keyboard toggle
- 80-column print preview
- Full-sized keyboard overlay with command summary
- Supports 1581 sub-directories, 1700 and 1750 RAM expansion
- Built-in file translator reads format commands from over 14 other word processors
- Read/write in nine different file types
- Split-screen option (80 column only)
- Confidential file encryption/decryption
- Word/paragraph count
- Define and sort up to ten columns
- Store hundreds of word/phrase macros for quick typing
- 63K text area, 16K buffer. Multi-text areas allow up to ten documents in memory at once
- Batch search and replace
- Mail merge, database interfacing
- 21-function calculator
- One-pass double column printing

This list merely scratches the surface and hardly does justice to the scope of the program. Dozens of additional features range from standard issue to truly innovative. The deeper you dig, the more amazing "BB Writer 128" becomes.

Yet there's always room for improvement. Many aspects of the program, from the auto-boot loader to keyboard control commands, can be redefined by the user. Machine-language programmers will even find a complete memory map for adding their own features. Design an auto-save feature, for example, to work in conjunction with the built-in alarm clock.

Busy Bee continually supports users with both a bulletin board and user newsletter. Rumored to be in the works are a dictionary, thesaurus and grammar checker. Because of its multiple-file format capabilities, spell checkers from other word processors can be used. Lee surely must realize, however, that dictionary disks are absolutely essential to remain competitive in today's market. As for a thesaurus, buy a paperback. Software versions are merely gimmicks. [***Editor's Note:*** *A 70,000-word Spell-checker will be available for $10 by the time you read this.*

"BB Writer 128" takes time to learn, but your efforts will be well rewarded. Casual users can enjoy working with the easy command menu, although advanced users will prefer the fast control-key system for utilizing the 60-plus keyboard commands.

The program's keyboard overlay is one of the best I've seen. It's also one of the few cut to incorporate every key on the 128. Helpful hint: For this, or any other keyboard overlay, use reusable poster putty (called "Fun-Tak" or something similar) to secure the cardboard to your computer. It works better than tape and can be easily placed and removed hundreds of times (leaving no residue). Available at most office supply stores.

"BB Writer 128" is a post-formatting word processor, a must-have feature for both speed typists and writers. The program features over 64 embedded format codes—many of them user-defined—in-

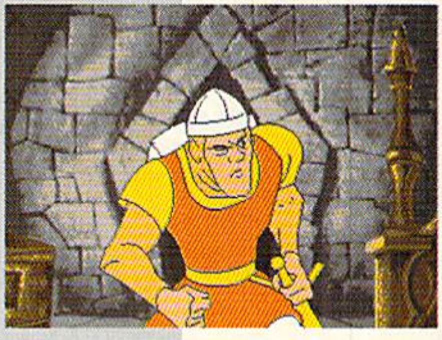
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Reviewed by Jeffery Scott Hall

Dragon's Lair

Computer: Amiga*
Publisher: ReadySoft
P.O. Box 1222
Lewiston, NY 14092
Price: $59.95

Both the characters and backgrounds appear in 3D in such tremendous cartoon quality you will swear you're watching Saturday morning TV.



Have you ever wanted to play *Dragon's Lair* at home? If so, then you should check out ReadySoft's version of the coin-op classic for the Amiga. Ask any arcade addict and they will all say the same thing—*Dragon's Lair*'s appeal is unique. It has captured the imaginations of thousands of players who just couldn't believe their senses. The game's appeal stems from the fact that the graphics are not flat images, but rather actual cartoon drawings which the player can manipulate throughout the game. The dazzling sounds result from real studio mixed effects applied to game play, which make for bone-chilling realism. Even better yet were the digitized voices, synchronized with the characters to make you feel as if you were actually inside the game itself. Now, let's find out just how the Amiga version of *Dragon's Lair* stacks up.

Where Art Thou Fair Lady?

As Dirk the Daring your ultimate goal is to find and rescue the beloved Princess Daphne from Singe the evil Dragon. There is just one problem—Singe has encased himself within a large and very complex castle where he holds the Princess captive. Clutching your sword, you enter his evil castle.

As the screen comes to life, you may not be able to believe your eyes. The replication of the laser disk game is almost exact, and game play is very true to the original. Both the characters and backgrounds appear in 3D in such tremendous cartoon quality you will swear you're watching Saturday morning TV. If your Amiga is connected to a stereo (which I highly recommend for this game) then your ears will hardly believe what they are hearing. All sound effects and voices have been duplicated directly from the arcade game, providing some of the best sounds you've ever heard from your Amiga.

Singeing Singe

Dragon's Lair is played by making a serious of moves in corresponding order, with all choices left up to you. Since the whole idea behind this game is to figure out what moves get you past certain obstacles and creatures, there will be no discussion about how this is accomplished. However, I assure you that if you've played the original coin-op version, you will be able to start playing the game immediately. Most sequences found on the arcade are duplicated here, not to mention the drawbridge scene which was found on only a few coin-op versions in the U.S.

You begin your quest on the drawbridge, where you must fight your way through the castle's inner walls. Each game sequence consists of about 30 seconds of actual play, which roughly compares to the original. Since there are only a few sequences per disk, there are six disks containing a whopping 130 MB of game play. This means that you get an almost exact reproduction of the coin-op, a fact that will make *Dragon's Lair* fans extremely happy. Of course, to win this game you must make it to the final showdown between the handsome young fighter (that's you) and the fire-breathing dragon (that's Singe) to see who will possess the Princess. Remember, you're her knight in shining armor, so don't let her down. After all, Princesses can be quite romantic!

Coin-Op vs. Amiga

One of the first differences a *Dragon's Lair* coin-op player will notice is that the sequence when you get killed is missing. In the arcade version I played, when Dirk gets killed he will fold his arms with a disgusting look on his face as he boldly grunts an angry "Humh!" Some of the other death scenarios are also missing.

The next thing you will notice is the time delay between the arcade sequences. Since the game is provided on six disks (while quite reasonable for a game such as this), it requires many disk swaps even with two drives. On the original, there are few if any time delays, since the game is on laser disk.

Last, but not least, you will notice that some voices are left out at certain times (especially during the introductory sequence). When considering these "limitations," keep in mind that the price of the coin-op version is around $12,000.

Now it's time to see what the Amiga version can do. As I've stated before, the game has been closely duplicated from the coin-op version. I'll give the programmers an A for achieving such high standards with this game, and confining it to a mere one megabytes for the Amiga 500/2000 and 512K on the Amiga 1000. You might be wondering about the differences between the two versions; there are none. Since the Amiga 1000 has 256K in it's Writeable Control Store that really isn't ever touched, the programmers have accomplished a first by utilizing this extra memory with no special requirements.

You can install *Dragon's Lair* on a hard drive, providing it's by Comspec. (This limitation—explained in the manual—is too lengthy to describe here.) Also, you can toggle the audio on and off which is something that's not on the arcade.

Other nice features include a low-pass filter which improves sound on some Amiga 500's and 2000's, a high-resolution mode which condenses the game into the center of the monitor giving you a different perspective to playing the game, and toggle interlace on or off to eliminate scan lines.

Summary

Simple mathematics will tell you that $60 from $12,000 gives you a total of $11,940 left. I don't know about you, but I feel the price of the Amiga version certainly beats that of the coin-op version,

Continued on page 87

Reviewed by Steve King

Zany Golf

Computer: Amiga
Publisher: Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Price: $39.95

Throughout the course there are opportunities to earn bonus strokes by hitting a roving pixie who looks just like Tinkerbell.



Zany Golf is, well . . . zany indeed. Simply speaking, if Woody Allen had designed a miniature golf course, this would be it. Unlike real miniature golf, however, there are only nine holes. The game itself is played like an arcade game: you can't advance to the next level, or hole, until you have successfully completed the prior hole in the number of strokes allowed. Moreover, you (and up to three other players) start out with five strokes, and as you putt your actual strokes are deducted from that total. At the beginning of the next hole, the par for that hole is added to your remaining strokes. So when you run out of strokes, the game ends and you must start from the beginning.

Throughout the course there are opportunities to earn bonus strokes by completing a hole within a specified time, by hitting a roving pixie who looks just like Tinkerbell, or by putting the ball through designated obstacles.

Before you play each hole, a preview screen gives you an overview of the hole as well as any special instructions. The view is from above looking down at a 45-degree angle, and the holes themselves are larger than the viewing screen, so you have to scroll around to see all the sections of the hole. At the beginning of each hole segment is a superb but short musical interlude. To play, simply place your mouse pointer on your ball, hold down the left mouse button, and pull the mouse away from the ball in the direction opposite where you want it to go. The further away from the ball you pull the mouse, the harder you'll hit it. Let go of the button and off it goes.

And now for the course itself. The first hole, while not so unusual, is really not that easy. It is a bi-level hole with a spinning windmill on the upper level. If you're lucky enough to get the ball past the blades into the windmill, it will drop down to the lower level and end up near the hole. Otherwise, try for the gutter which will get you down there through a flashing lighthouse, but not near the hole.

The second hole is a U-shaped arrangement called "Hamburger Hill." A large plastic ketchup dispenser sits at the first turn. Hit it just right and your ball will bank precisely towards the hole, and the dispenser will spew globs of ketchup in the air which plop down into the messy pool at its base. Oh, by the way, there is a hamburger "with the works" sitting right on top of the hole. To move it, you must click on the mouse button rapidly: as you do, the burger bounces up and down as if on a trampoline.

The third hole, "Walls," requires you to hit the ball along a narrow area in which several walls rise and fall blocking your path. Radiating downwards from the right is another area, the bottom of which is divided into several sections, one of which contains the hole.

The fourth hole is also bi-level, but here the upper level is a pinball machine. To get to the lower level, you must get your ball into a hole at the upper left of the machine. This I discovered was no mean feat and depended more on luck than on skill.

The fifth hole has several levels accessed by ramps extending in all directions. Fans are placed at critical junctions to help blow the ball in the right direction. To activate the fans, you must jiggle the mouse rapidly. With proper coordination, it is possible to navigate these hilly ramps and even get a hole-in-one.

The sixth hole is the Magic Carpet where you have the opportunity to steer your ball with the mouse when it rolls over any of the checkered areas on the green. To complicate matters, you must get the ball under deflector bars which rhythmically rise and fall.

The seventh hole is a castle on a hill where the hole is on an island in the foreground. If you can manage to putt up to the castle and get the ball through the entrance, it will magically appear on the island.

The eighth hole is the "Ant Hill"—a raised hub surrounded by rectangles radiating outwards like spokes on a wheel. At the far end of each area is a bumper which you activate by pressing the mouse button. The aim, of course, is to bump the ball up onto the ant hill so you can putt it in the hole.

The final hole, known as "Energy" really defies description. In fact, the only instructions given are "Hit the buttons on the big computer." It looks something like Dr. Frankenstein's basement laboratory, complete with stone floors, flashing lightening and pipes snaking all around. Here, plasma arcs spark, photon projectors hurl blobs of energy, and vaporizers disintegrate your ball. This hole is a challenge and a half.

There is no disputing that *Zany Golf* is both creative and challenging. It does, however, suffer from several flaws. If you use up all your strokes, the game ends and you must start over. This becomes quite frustrating and tedious, as it takes a while to load the data for each hole. The graphics are quite good, but not really crisp or excellent. In the pinball hole, for example, the ball bounces before it hits anything. Finally, there are only nine holes, and once you master them, the game becomes "old." *Zany Golf* is a cute, entertaining game in the *Marble Madness* genre, but unless you're a miniature golf fan, the novelty may soon wear off.

Reviewed by Gary V. Fields

Better Dead Than Alien

Computer: Amiga
Publisher: Discovery Software
163 Conduit Street
Annapolis, MD 21401
Price: $34.95

Better Dead Than Alien is an improved and challenging spin-off of the *Space Invaders* arcade classic. But don't be put off by the suggestion that this one is sim ply a rehash of an old game. Where *Space Invaders* ends, this one begins. The challenge of the older game was simply to survive, but this one goes beyond that and above all, it is fun. When you boot up *Better Dead* be prepared to laugh.

At first glance it is easy to compare the program to the invader game, since most of its screens (and there are dozens of different screens) show wave after wave of invading aliens slowly descending and bombing your defensive position. And like another classic, *Galaxion,* individual invaders will routinely break away from the formation and swoop down on your position. The developers of *Better Dead* took the best parts of those two classics, combined them and added digitized sound effects, power pellets, bonus units, a two-player option and some of the strangest, funniest and best-defined invading aliens you could ever hope to see. Those early games earned the right to be called classics, and I predict this one is destined to follow them into the arcade hall of fame.

The thing I like about *Better Dead Than Alien* is that it can be played either solo or in cooperation with another player. This means you can have a partner at your side helping you survive. Or if you prefer, because the hits registered by both players are recorded separately, you can compete against another person. And unlike the original invader game, your defense platform can move up and down as well as right and left—but there are no defensive shields to hide behind. Beyond the obvious fun of two-player action, lots of laughs are produced when in the confusion of battle, your partner (or opponent) accidentally blasts one of the enhancement pellets (instead of catching it) when it is released by a wounded alien, or you become confused about which defense station you are controlling and fail to dodge an attack.



The physical appearances of the invaders are a delightful mixture of the threatening and the humorous.

The physical appearances of the invaders are a delightful mixture of the threatening and the humorous. One of the master invaders is a huge, missile-firing brute which looks like a cross between an octopus and a jellyfish. Not only is this fellow odd looking, he is nearly indestructible—you can chase him off but you'll rarely destroy him. Two other aliens which always inspire some giggles look like giant heads—one resembles a red-eyed, scaly-faced muppet, and the other reminds me of an old bald-headed man. The first you must destroy piece by piece, while the second must be forced to retreat.

Attacking between these master invaders are levels of formation after invading formation of bugs, aliens and "doo-dads" which get progressively more resistant to your missiles. For instance, at level one you can scratch an alien with a single hit, but at the advanced levels, you must blast them three, four or even five times to terminate them. And for those who enjoy blasting their way through an asteroid field, that thrill is included too. But regardless the opponents you'll face here, they all have one thing in common—they are deadly.

Those who like options will be happy to know each player's ship can be controlled by either a joystick, mouse or keyboard, so there is no restriction on controlling devices. I prefer a mouse, while my son feels he does better with his favorite joystick. The game keeps track of high scores during sessions, but does not record them on disk.

All in all, *Better Dead* is an excellent arcade challenge which will appeal to all ages. My eight-year-old son and I (I'm 39 plus) love to team up against the nasties. The action is fast and varied, the sound effects are digitally perfect, the graphics are excellent, and there are dozens of challenging levels. But above all it is fun—the different digitized sound effects which are heard after each victory or defeat are sure to touch everybody's funny bone. For example, instead of using an explosion sound when your defense platform is hit by an alien or his missiles, the word *ouch* is sounded instead. That may not sound too funny, but during actual play it is.

It was refreshing to play a game where the programmers didn't take their work and the game's traditional "you-alone-can-save-the-planet" scenario so seriously that they couldn't laugh at it and get you to do the same. On a scale of ten, *Better Dead* gets the highest mark.

Better Battling

- Getting through all the invading aliens may seem impossible, but there is a way to survive all the screens. I've seen the last attacking wave, but only because I discovered a "back door" which made my defense post almost invincible. I won't tell you exactly how to access the cheat mode, but I will offer a cryptic hint: "Only a CHAMP can succeed and even he will need HELP."
- If you just want to face one of the advanced waves of invaders (to experience just how tough they are), select the level option and then type in CROSSWORD for the sector reference. You will be able to battle with one of the more challenging invasion patterns. At this level each alien can absorb three direct hits without being stopped, while at the same time they will be pelting you with salvo after salvo of bombs. ■

Reviewed by Gary V. Fields

The Awesome Arcade Action Pack, Volume 1

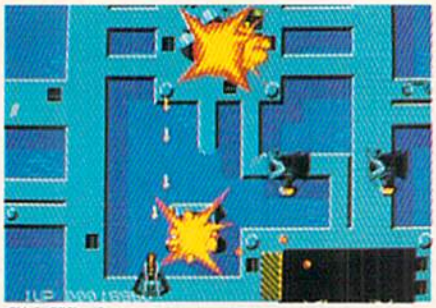
Computer: Amiga
Publisher: Arcadia/Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Price: $49.95

Was it arrogance or self confidence that inspired the word *awesome* in this title's name? In my opinion, any software developer who labels a game collection awesome, is inviting some hard criticism. But after playing with the trio in this pack—*SideWinder, Xenon* and *Blastaball*—I concede that the label is appropriate. The three games in *The Awesome Arcade Action Pack, Volume 1* would have been hits even if sold separately. They are all excellent arcade offerings in every aspect, combining action, challenge, graphics and sound effects.

SideWinder

SideWinder's fast action, beautiful graphics and challenge are as good as those on any game which has ever traced the screen in a quarter-eating arcade machine or anywhere else for that matter. The scenario is simple and classic—you must take on a massive enemy force single-handedly. As you attempt to penetrate the enemy's fortress flying your lone fighter craft, you encounter a horde of enemy crafts, missiles, obstacles, gun placements and assorted dangers. As you progress from one level to another, the enemy defenses grow more aggressive, difficult and dangerous. The only help you will receive on your mission is an occasional power pack which reinforces your craft. The first is rapid-fire capability and the last is the ability to hover, rather than being constantly projected forward.

What I found so appealing about *SideWinder* are its excellent graphics and smooth movement. The well-defined fighter craft responds accurately to joystick pressure (e.g., when you signal it to bank right, it rolls to the right). But all of the game's graphics are real killers. The fighter casts a shadow as it moves over enemy territory; attacking forces are all realistically defined; explosions look (and sound) like destructive blasts; and when an enemy emplacement is hit, instead of being



SideWinder

removed from the screen it is replaced with a realistic, damaged image.

If you are really good, or just suicidal, *SideWinder* offers five different levels of competition, starting with Beginner and progressively getting more difficult until you get to Master level. At the Master level, my chances of surviving the alien star craft are about as good as a flea's sitting on a hot coal. I'm much more successful at the Beginner level, but because there are five different degrees of difficulty, *SideWinder* will remain a challenge for a long time.

Xenon

Of the three games, *Xenon* is the most complicated—to survive here you need not only quick reflexes, but also information about the enemy you encounter. At first glance it appears to be a simple fly, shoot and dodge exercise, but approaching the game with that attitude will end your career as a fighter pilot almost instantly. When the game begins you are on a mission to rescue a downed companion. To save him you must battle your way through enemy territory in your convertible fighter craft (you can toggle between ground and air action). Before you finish, you'll have to identify and defeat over 20 different types of alien defenses. Some are stationary, some fly, and others are ground based. The trick is to identify the enemy quickly and properly convert your craft (from air to ground or vice versa) to match the threat. Once that is done, you must still out-maneuver and out-shoot them. All this is not as easy as it may sound. For instance, if you mistake a low-flying opponent as a ground unit and convert your craft to ground controls, you have turned yourself into a sitting duck. On the other hand, if you try to match a ground-based enemy from the air, the same deadly results are almost as certain.

Because *Xenon* combines great graphics (including digitized and animated images of Captain Xod), three-dimensional playing field, fast action and good sound effects with an enjoyable challenge, it is a game most arcade players will like. As you progress you can retrieve power pills which increase your craft's fuel, armor and firing power, so a really good pilot could finish a mission with a more powerful craft than the one with which he began.

Blastaball

Of the three, this is my least favorite. *Blastaball* is a sort of futuristic game of hockey where the players use spacecrafts instead of skates and laser cannons instead of hockey sticks. The idea is to maneuver the puck across the end line of your opponent's field (for one point) or into his or her goal box (for two points).

Adding some strategy to the game, each player is allowed to select the particular craft he or she wants to pilot from a list of ten. Each has different attributes (controls, power, armament, etc.), so making a wise decision will seriously affect your performance in a game. You can compete against either another human or a computer-controlled opponent. To move the puck you either collide with it or blast it with your cannon.

The only reason I have not become an ardent *Blastaball* fan is that I've found the computer unbeatable. Once I've let the computer's craft move the puck past me, I've found it nearly impossible to regain control before the it goes sliding across my goal line. I hate losing, and when I play the computer I experience that repeatedly. On the other hand, playing *Blastaball* against another flawed human, like myself, can really be fun.

The craft responds much like a spaceship—you rotate the nose of the craft in the direction you want to move and then apply thrust. To change directions you must rotate and apply thrust again (for you old-timers, the crafts here are controlled exactly like those in the old 64 *Omega Race* game). The computer doesn't have any trouble mastering these controls, but I had to spend a lot of practice time with the game before they became second nature. That's why I find humans more fun to play—they make mistakes too.

In the heat of competition, trying to keep track of where your opponent is, maneuver your craft and at the same time

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Reviewed by Jeffery Scott Hall

Robbeary

Computer: Amiga
Publisher: Anco Software
P.O. Box 292
Burgettstown, PA 15021
Price: $24.95

Robbeary, from Anco Software, puts you in the middle of the greatest heist in history. Bertie Bear is one of the greatest criminals of our time, and his specialty just happens to be (surprise!) robbery. You assume his role as you enter one of the largest and most valuable department stores ever to be constructed. However, since robberies almost always occur at night, you will be faced with the greatest challenge of your life. The store you are about to rob has the most frightening security guards ever seen by man or bear, because this store contains more mutated creatures than you can count. Knowing that you will go down in history as the most famous non-violent criminal ever with the success of this robbery, you decide to enter the building.

Once game play has started, you will always find Bertie Bear located in the center of the screen with a generous supply of five extra lives. At the top of the screen you will notice three displays; these show your current score, the highest score and the level you are playing. Also, at the bottom center of the screen you will find a timer which is set for a certain amount of time according to the level you're on. If this timer runs out before you complete that level, it will result in instant death.

Controlling Bertie Bear is done by moving the joystick in the direction you wish to move, and pressing the fire button will cause him to leap up in the air. This makes the game more difficult because you will have to think carefully about each move before actually making it.

Bertie Bear's Unpopularity

Bertie Bear has made some enemies during his career to say the least, and all of them have gathered together for the final confrontation with him at the department store. Bertie's enemies are unique in appearance and intelligence, getting smarter as you progress through the game. The enemies you will encounter range from large animals to mutated creatures bent on stopping your quest. Depending upon the level you are in, some of the creatures will be very slow and easily avoidable while others will be super fast causing the most masterful arcade player to panic.

> Bertie has made some enemies during his career, and all of them have gathered together for the final confrontation with him at the department store.

Robbing the Store

The goal of *Robbeary* is to make it past all 24 floors (or levels) in the department store collecting as many valuables as possible, while avoiding contact with any creatures guarding the store. If captured by the enemy you will die immediately. If you have an extra life, you will start over at the beginning of the current level. Each of the floors have beams which you can walk across and jump up or down providing it is not too far from your location. You will also find ladders on each floor which will allow you to climb greater distances than you can jump giving you access to the entire floor. However, this will be a lot more difficult than it sounds due to the enemies in constant pursuit.

In order to help give you a better chance at completing your robbery, you will find bonus objects throughout the floor. These objects are too numerous to mention here, but a few of them include candlesticks which turn the guards into precious diamonds, a stop watch that freezes time, and a cross that makes our friend Bertie invincible. Many others are encountered only on certain levels, while some appear almost constantly.

Summary

I have only two minor complaints with *Robbeary*. First, the screen display is just fine where graphics are concerned, but the text is a different story. The game was obviously designed to be played only on PAL monitors which have a wider display horizontally. This means that some of the text isn't fully visible at all times. My other complaint: In a game as fast paced as this, one definitely needs to be able to pause the action for a well-deserved break.

However, I don't feel these minor complaints detract from the overall game play. Anco included a top-eight score table for those who manage to escape with enough stolen goods to qualify. The graphics and sound effects are very good, and the game play is both fast and complex due to its 24 different levels of play. ■

Bertie's Secret Hints

- Never jump more than one beam at a time, for if you do it will result in your death. When it is impossible to jump, wait for one of the bonus objects to appear which will give you a platform which you can use to climb either up or down.
- Keep an eye on the timer; if you have fewer than 30 seconds left don't worry about any bonus objects—go only for the valuables.
- Whenever you start a new level, you will have several seconds before the enemy appears. You can take advantage of this by going to what you think are the difficult spots on the floor and collecting the valuables before the creatures appear.

Next Month in Commodore Magazine

All about Epyx

Ten years old already. From *Temple of Apshai* to *The Games: Summer Edition*, Epyx has grown up quickly. Read all about the company, the people and the products that are Epyx. And what's this about a sequel to *California Games?*

Sound Investments

Considering using your Amiga for music? Then this is a feature you don't want to miss. Included are the ins and outs of MIDI recording, some short software reviews and advice from recording musicians.

Best of Amiga Public Domain

Each month we publish an Amiga public domain column, and once each year we select the best of what we've reviewed. Find out what the year's best public domain software is in categories from animation to telecommunication.

Available on newsstands July 20, 1989.

Reviewed by Russ Ceccola

Cosmic Relief

Computer: Amiga*
Publisher: Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
Price: $34.95

Arcade adventure games have got to be one of my most favorite types of games. They are challenging and fun and fill up an hour or two when you're looking for something to do. I always like getting new arcade adventure games in the mail—especially when they're for the Amiga. When that's true, then I am also in for some incredible graphics. Such was the case with *Cosmic Relief: Professor Renegade to the Rescue.*

Datasoft always put out consistently good programs, but none has been as good recently as *Cosmic Relief.* This game has all of the elements that I look for in a great game and then some. If the great graphics and game play aren't enough, the wacky characters and plot will blow you away.

Cosmic Relief has what I guess you'd call a typical "B" movie plot. In the game, you choose one of five international characters as your computer counterpart. It seems that an asteroid the size of Louisiana is heading straight for Earth. Over 40 years ago, a certain eccentric Professor Renegade warned the people of Earth that such an asteroid would be coming. Of course, nobody listened to the good Professor; his attempts to warn humanity were unheeded.

After his ideas for saving the world were rejected, Professor Renegade became a recluse, went far away and hid himself. Now that all the important people of the world can see the asteroid coming straight at the planet, they are desperate for the professor's help. Unfortunately, nobody knows where the old man has gone. You must travel through dangerous wilderness to find the professor and enlist his aid in saving the world. He is the only one capable of saving the planet, and his every desire must be met if your mission is to be a success.

Professor Renegade's greatest asset is his ability to invent and build things. In addition to finding the professor, you must also pick up items along your journey that he will use in building a working anti-asteroid deflector. This dual goal makes the game more fun, as well as more frustrating.

The bulk of your efforts in *Cosmic Relief* will be spent trying to stay alive, exploring the game world and finding the use for and collecting all of the objects.



You can't tell what a lot of the objects along the way are, but if you collect everything you find, you can't go wrong. As you walk along, you pick up any object you move over or touch. You would think that after a while, you'd have too many things in your inventory. This is not true. There are "bearers" to the right of your character who each hold a different item. Because you can only carry and/or use one object at a time, you must let the bearers carry the rest. The way you do this is by swapping objects with the bearers.

As you pick up an object, it appears in a window above a copy of your character at the bottom of the screen. To the right of this window is another window that has three bearers (who look like restless natives from the Congo region) visible in it. Above each bearer is room for an object. If the bearer right next to the copy of your character has no object, the one you are carrying switches to the spot above the bearer when you hit the "S" key. In addition, you can scroll bearers to the left and right with the "1" and "2" keys. By scrolling to an empty bearer and pressing the "S" key, you can store your objects away for later use. This is a very effective way of keeping track of objects that you find, since there are so many.

Cosmic Relief is so chock full of objects that you don't know what to do with them all. To help you in figuring out what to do with such things as a flute or a vacuum cleaner, the game includes an option called "thinking." By pressing the "T" key, you are sometimes given hints in the game. These hints are in the form of objects that appear above your head while you are thinking. When this happens the game is telling you that you need this object to get past whatever obstacle is on that screen. For example, on the screen with rock snakes, if you hit "T," the character scratches his head, and a flute appears above it. If you have picked up the flute already, obtain it from the bearer who has it by swapping, and you can charm the snakes with the flute. As another hint, you use the vacuum cleaner on one ground screen only to fly up to the clouds. By thinking, you can get help in a lot of different situations. However, it is important to note that thinking does not always work—you might actually have to use *your* brain sometimes.

In this adventure game, you must assume the role of one of five "adventurers." Each adventurer is from a different country. These countries are (by chance ?) the countries with the biggest sales in computer games. You can choose any country representative you want. Your choices are Fortisque-Smythe from England, Big John Caine from America, Herr Krusche from Germany, Wu Pong from Japan and Henri Beaucoup from France. Each character is distinctive on the screen and each has his own facial expressions, etc.

You may wonder what separates one character from another. Each character has a special "key" item that he must be carrying to finish the game. None of these key items are needed to build the anti-asteroid deflector device. Instead, the key item for each player is just one of the objects that is used to get farther in game. Each adventurer has his own key item. These items are related to the nationality of the character and will seem fairly obvious, especially after you read the descriptions of the adventurers in the game manual—each character's key item is mentioned in his description. You must read carefully and think clearly.

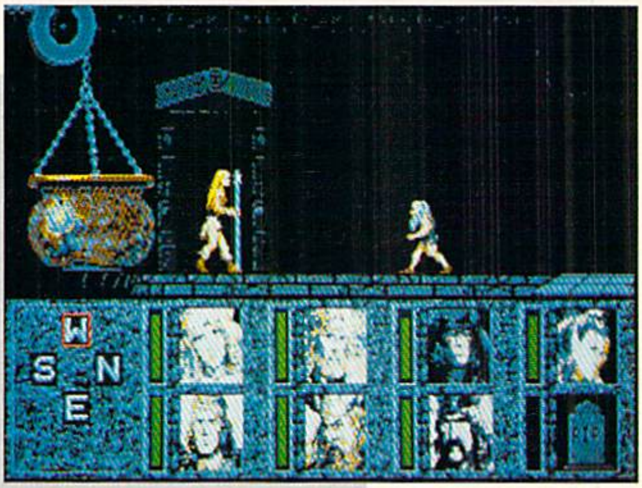
The bulk of your efforts in *Cosmic Relief*

Continued on page 88

Reviewed by John Ryan

Heroes of the Lance

Computer: Amiga*
Publisher: Strategic Simulations, Inc.
1046 N. Rengstorff Avenue
Mountain View, CA 94043
Price: $39.95



It's been three hundred years since the tremendous cataclysm that fell upon the great nation called Krynn—a disaster brought down upon the land by angry gods. The Queen of Darkness, seeing an opportunity to spread her evil wings over the land, compelled mighty dragons to do battle on the side of darkness. Her plan was rather simple: Control Krynn, and entry into the free world would be assured. The land's only hope of resisting her great power lies on the heads and swords of a small band of warriors—the Companions of the Lance—not yet heroes, for that honor is yet to come.

If these adventurous warriors can recover the Disks of Mishakal from the Xak Tsaroth ruins, faith in the old gods may be restored and the queen held in abeyance. There's only one small problem: The disks are guarded by an ancient and huge black dragon, a nightmare of teeth and leather. Yes, this is a problem. This is a challenge. This is *Heroes of the Lance*.

Heroes of the Lance has been, until now, a highly popular Advanced Dungeons & Dragons® campaign that has existed only in the minds of its players. Now, in cooperation with TSR, Strategic Simulations has translated this mythical saga into computer format, where heroes and heroines struggle against almost insurmountable odds. Within Krynn's ancient ruins are Draconian hordes and a host of other nasties, all intent on keeping you and your companions from reaching the mystical disks. Of course, finding the location of the talisman may be far easier than actually taking possession of it. You'll find the disk's guardian, Khisanth the ancient dragon, a nightmare rendered from your most hellish dreams. (I'll give a hint right up front: You can't outrun him!)

Heroes of the Lance comes complete with a pre-built party of adventurers. Each of the eight characters has different levels of ability in areas such as strength, wisdom, dexterity and charisma, to name a few; and these attributes cannot be changed prior to play, so it is a good idea to pay close attention to the statistics of each player. Get to know them. Only by using each character's unique abilities can you succeed in this game. Likewise, since the party is multi-racial in makeup (dwarves, elves and humans), some characters accomplish tasks better than others, whether it is fighting a certain monster type, locating traps or jumping over obstacles. Using them effectively against the dilemmas thrown against you is the most pivotal aspect of the game.

As the game begins, you are presented with a quick overview of each player, complete with a concise character background. Much of this information is also presented in the 25-page manual, so you can quickly bypass the opening screens (which include very nice high-resolution portrayals of each character).

This is a graphic adventure. While that may not sound so special to some, keep in mind that I'm talking about an *Amiga* graphic adventure, with all the speed, color and detail that you would expect from top-of-the-line Amiga software. The screen is divided into two main sections: the graphics screen, where all the action takes place, and a character icon area, where each of your party's players is represented. During play, the graphics screen smoothly scrolls left or right, depending on the direction a character is moving. Since the entire party is represented onscreen by whomever you select as party leader, only one character will appear at a time.

The animation, for both on-screen characters and the background, is simply marvelous. Player movement is very fluid and lifelike; your alter egos walk, run and leap as you patrol the ruined temple. During exploration, crumpled buildings, shrines and ominous doorways and corridors scroll "behind" the party, imparting a three-dimensional feel. Even though you can enter many of the buildings and crossroads, some entrances and portals are hard to spot. For this reason, among others, a small compass at the bottom of the screen will activate whenever a new path can be taken, highlighting the directions in which the party can travel. Not all of the background graphics are there for window dressing, either. Along your path are weapons, magical shields, potions, scrolls, gems and a host of other goodies that can be collected by the party leader.

Surviving long enough to complete your quest will take a combination of heroics, resource conservation and luck. There is an endless parade of monsters and other evil vermin to contend with. You can, however, survive most confrontations if you take your time and think! As a monster attacks, it must walk (or run) onto the screen to reach you. This gives you time to use ranged weapons such as spears, throwing axes, arrows or magical attacks while the beast is still out of sword's reach. Once the attacker gets within a few feet of

your main character, however, ranged weapons will become useless, and you'll have to resort to hand-to-hand combat.

This is where a character's physical characteristics and handicaps come into play. A Dwarf, for example, is a superb match against other Dwarves—and his throwing axe is positively devastating—but you will probably not want to match him up against a dragon. Conversely, your tall, statuesque fighter can make short work of a mercenary, but those slippery little Dwarves will fairly dance around his feet! As you enter battle, you can interrupt the sequence to select a new leader if the current leader is unacceptable for the situation. Pressing any key will bring up a menu that contains options to cast spells, trade or drop items, rearrange the marching order of your members or pick up items, among other things. (This menu can be called at any point during the game.) There is an important point to address here, for only the first four characters in the marching order are considered in combat. So while only a single character is presented on screen, the other three characters behind the leader can take damage during the course of battle. Moreover, priest and mage spells can be cast only if the spellcasters occupy one of the first four party slots—critical if you need to cast a quick healing spell in the midst of battle.

Once a leader is selected for the battle, ranged weapons can be loosed at the attacking monster. Projectiles can be aimed high, mid-level or low, selected according to the size of the target. This also applies in hand-to-hand combat. Blows can be placed to an attacker's head, mid section or—well—lower than the mid section. As each blow lands, crisp, digitized battle cries, groans, grunts and the harsh clang of sword against sword sounds as the struggle proceeds. If the fight is successful, your adversaries will dissolve into so much dust.

Of course, it may go the other way as well. Near each character's icon is a small thermometer-type bar that represents the relative health of the player. As an adventurer is hit, this bar will begin to slide down and will turn red if the wounds become critical. If the player falls in battle, the next character in the marching order will move forward and take the fallen warrior's place.

Characters killed in combat can be resurrected by the priestess only if the party does not leave the area where death occurred. If you depart the battle area, or dally too long without taking action, your fallen comrade will be lost forever, his icon replaced with that of a dreary gravestone. Resurrected players return with minimal hit points and require substantial first aid to regain their strength.

Spells can be cast by the priestess or the mage. Each spell costs certain amount of spell points to cast. Once these spell points are used, no more will be granted during the game. Conservative and thoughtful casting is definitely the order of the day. Thankfully, there are numerous scrolls and potions scattered throughout the temple to ease the workload of the spellcasters. Spells are used much like ranged weapons during combat. Once a spell is selected, it is considered the "ready" spell until the next time a new spell is chosen.

The creatures and traps found in this game demand respect, caution and attention to detail. The various beasts include men, Draconians, giants spiders, trolls, specters, gully dwarves, hatchling dragons and wraiths. All are superbly animated, all are deadly, and all require a different approach during combat. Traps, on the other hand, can be discovered beforehand by wary travelers, though, more often than not, it is the clumsy foot or inattentive grasp that discovers the effects of rock slides, falling columns and tripwires. If you're quick, your character may be able to leap swiftly out of harm's way. If you're not—well, have your priestess ready.

I have never played a game so engrossing. From its digitized sound to the wonderful graphics and animation, it is hard to focus on any shortcoming the game might have. Even its documentation, usually a program's weak link, is written in a chatty, informative style, with everything you'll need to play effectively. I found only one small irritation with this program, really—just an irksome detail, but important. The Amiga is a wonderful machine, with capabilities unheard of until now, but about as flexible as a steel girder with only one disk drive. So why, SSI, can't the program detect a second disk drive when it asks for this game's "b" disk? Come on, fellas. An Amiga program that can't detect a second disk drive? I don't know why, but it severely tested my patience when I plopped the disk into df1: and still had the disk requester staring me in the face!

This small quirk aside, *Heroes of the Lance* has definitely set a new standard for others in the industry to follow. Whether you are a conventional role-player or an arcade buff, you'll find a little of everything here. Like those who may have achieved the status of Heroes of the Lance, I eagerly await a sequel.

**Also available for the Commodore 64.*

Helpful Hints

• Learn when to duck! Smaller characters can easily duck blows and magical assaults, but it takes practice. Try the ducking maneuver outside of the temple, where you won't be harassed. This will save you a lot of hit points.

• Don't heal a character every time he or she loses hit points. Spell points are precious and you won't get anymore (which will give you absolutely no hope of defeating the dragon). When a character is severely injured, move him to the back of the party for safe-keeping until potions can be acquired or a place of healing found.

• Don't waste your arrows; there's a limited supply and they come in handy at long range. Use arrows on men and gargoyles—don't waste them on hatchling dragons—they'll be useless.

• Speaking of hatchling dragons, there's only one sure-fire way to kill them. First and foremost, don't waste precious spell points by casting several short-lasting dragon protection spells. Cast one protection spell then run directly at the dragon (yes, I know it sounds crazy, but your strongest character can take at least one dose of dragon's breath). The dragon will actually back away from you and, if you stay within arm's reach of the dragon, it won't breath on you—though he will claw and bite if you get too close. You can vanquish the dragon by hitting it on the hind quarters area.

• Watch out for Bozak Draconians (I call them gargoyles). Their magical attacks can be devastating if you haven't learned to duck. Use a Web or Charm spell to immobilize it, then move in for the kill. Be careful, though: Even at the point of death, these bad guys can unleash a potent missile, so quickly get behind the Draconian after it begins to crumble!

• Your mage floats whenever you attempt to jump him over obstacles. There's a wide canyon on the second level in which only he can negotiate. I lost several warriors discovering this tidbit.

• Save your game often, especially before attempting anything hazardous (which could be every other screen). Losing just one important player can leave your party crippled. Lose your priestess and it's all over.

Reviewed by Gary V. Fields

DeluxePrint II

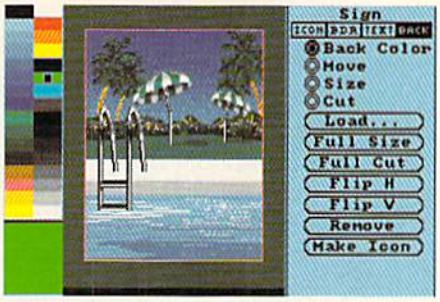
Computer: Amiga
Publisher: Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Price: $79.95

DeluxePrint II is the update of the premier Amiga publishing program. Although it is not a desktop publishing package in the traditional sense, it does put an affordable, yet substantial publishing machine within every user's reach. *DeluxePrint II* makes it easy for anyone to design and print anything from personalized calendars and address labels to business letterheads and four-sided greeting cards.

The program is so simple to use that anyone familiar with the point-and-select interface common to most Amiga software can have *DeluxePrint II* up and printing without ever opening the manual. The main screen of each project displays similar options: palette, menu bar, corner sample, editing options and the main display area. Thus, switching from one print project to another doesn't require you to learn new commands. And because the display area accurately duplicates the project as it will print (including shape, color and location of text and graphics) all the mystery is removed. The resolution of a monitor screen differs from the resolution a printer can produce, so in most cases the final printout will be better than that shown on the screen. But what you see on the screen is very close to what you will see on paper. I was happy to see that *DeluxePrint II* includes a preview option which lets you view a highly-magnified version of the design.

Electronic Arts didn't forget that color printers are becoming affordable and popular either. The program supports an impressive 32-color palette. Thus color printer owners can print professional full-color projects which will rival those produced in commercial print shops.

The program's pull-down menu bar lets you select which design type you want to create: signs (single and four-tile), labels, banners, letterheads, calendars and greeting cards. The lower-left window displays what is called a "corner sample." This useful feature constantly shows the size and font you are currently using for text or the graphics available for editing or pasting.



Flexible editing options let you paste, move, delete, size, flip, edit, load and save specific elements which make up your design.

Flexible editing options let you paste, move, delete, size, flip, edit, load and save specific elements which make up your design. For instance you can load an IFF drawing (called an icon by *DeluxePrint II)* and edit it with the program's full-featured graphic editor and then turn it into a border element to surround a project. Or you could resize, change its color and paste as many copies as you needed anywhere you wish, without having to reload it. And you can paste it over or around other graphics or text.

One the things I like about *DeluxePrint II* is that each object used to create a design remains a separate element even after it is pasted in place. For instance, If I want to pick up a piece of text or an icon and move or discard it, that action does not affect any other elements in the design, even those it may be touching. This means you don't have to worry about destroying finished layers of your design while testing elements in different locations. This is possible because each element of a design is responsive to only one of the four independent editing modes: icon, border, text and background. To change modes, you simply click on the word and presto, every option you need is activated. I like this division of editing because it lets me concentrate on the task at hand. If I want to edit text, I select text and don't have to worry about accidentally altering the other elements. Anyone who has been frustrated by how easy it is to inadvertently select or alter the wrong element while using a traditional desktop publishing program will applaud *DeluxePrint II*'s solution.

The program is customized for seven different printing projects: signs, labels, banners, letterheads, calendars, greeting cards and four-tile signs. All are easily created, and most people will find a use for many if not all of them. Students will find signs and banners useful in school, while business people will like the ability to create business cards, personalized calendars and letterheads. And if you've ever wasted a full lunch hour futilely searching for the perfect store-bought greeting card for a special occasion, you can now create ones which reflect your exact sentiment.

I think users of the original *DeluxePrint* will be pleased with the improvements incorporated in this update, and new users will be happy with the program's powerful, yet uncomplicated interface. This update supports only IFF files—a welcome standardization of filing formats.

Unfortunately, because the original version supported its own unique format as well as IFF, and the clip art which came with the original *DeluxePrint* was stored in the non-IFF standard, you cannot use it with *DeluxePrint II*. The only way I have been able to access them with this update was to load them into the older program, and save them as IFF files—a slow and boring task.

The people at Electronic Arts recognize that incompatibility between the older and newer programs may frustrate some owners of the older program; they will be releasing similar clip art disks soon. It is ironic that the company which championed the adoption of IFF as the filing standard when the Amiga was first released would get caught in a non-standard conflict. What's important, however, is that *DeluxePrint II* now conforms to the IFF standard, and we hope to have seen the last of non-standard formats.

DeluxePrint II's manual is easy to understand and comes with a tutorial for creating each of the seven projects. It includes a healthy reference section and both an index and table of contents, so there is no time wasted hunting for the exact information you need. Thankfully, it is splattered with graphics displaying exactly what is referenced in the text. Neither the program disk nor extra art disk are copy protected, and both can be installed on a hard drive.

As good as *DeluxePrint II* is, it is not perfect. While bringing the new program

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Reviewed by Steve King

MovieSetter

Computer: Amiga
Publisher: Gold Disk
2171 Dunwin Drive, #13
Mississauga, Ontario,
L5L 1X2
Canada
Price: $99.95

For those of you whose creative bent leans towards animation, *MovieSetter* by Gold Disk is the perfect tool to get you started. Billed as a WYSIWYG ("What You See Is What You Get") animation and video program, *MovieSetter* makes it extraordinarily easy to create your own cartoons, complete with digitized sounds and moving backgrounds, that "project" at an amazing sixty frames per second.

MovieSetter takes the traditional animation approach of displaying a sequence of "frames." Each frame is a little different than the previous one; so when you play, or flip, the frames at a high rate of speed, you create a sensation of motion. A *MovieSetter* production is comprised of several elements. First, you need a background against which your objects will move. Second, you must add the objects that will be moving and specify the movement path. Finally, you add your sound effects at the appropriate places.

To begin your first production, load in a background (or a blank screen can be used if you wish). This can be any IFF format graphic up to 352 × 240 containing no more than 32 colors. This background immediately appears as the first frame. For example, to create a simple animation of a man walking down a street from left to right, you would load a picture of a street scene for the background. Each object that moves down the street is created on a separate track which consists of a number of frames where the image of the man is placed further to the right as the frame number increases. You don't have to worry about copying the background each time you create a new frame; the program does that for you automatically.

There are several ways to move the image (which has been attached to your mouse pointer when you selected it) across the screen. The first is by moving the mouse pointer and clicking the button wherever you want that object to appear. This stamps the image onto the background. The second way is to select the menu item "Guides." Then just draw a line or ellipse with your mouse, specify the speed and acceleration of the object, and indicate the number of frames it will take for your object to move the distance. *MovieSetter* does the rest.

> Editing tracks is a breeze; all you have to do is advance the production to the desired frame, click on the face you want to edit, and make the change.

Up to this point, you have probably imagined the moving object as static and inanimate—like a brush you have grabbed in a paint program. Here is where *MovieSetter* sets itself apart; the object is really a series of brushes called "faces," each depicting a slightly different view of the actual object. For example, there may be six different pictures of the man we are using with his legs in different positions. The entire collection of these faces is called a "set." If you were to view these faces rapidly, you would see the man walking in place. So every time a new frame is displayed the object not only moves across the screen, but the face itself also automatically advances to the next face in the set. And when you reach the sixth face, the next frame automatically displays the first one again. This creates the illusion of animated movement.

Once you have finished plotting the movement of your first set, you have several options. You can create more tracks by rewinding the production back to the beginning using controls similar to those on a VCR. You can then place either the same or different objects on the background. A nice feature lets you easily specify which objects will pass in front of the others.

One of the unique features, is being able to continuously scroll the background both horizontally or vertically. In our example, specifying a horizontal scroll with a negative velocity moves the background from right to left. While our man is walking to the right, the street moves in the opposite direction, giving the illusion of motion. This scrolling requires a bit of care in constructing your background, as both the left and right edges of the background picture must match up to produce a smooth, continuous image.

Another option is adding sound effects. At any frame you can specify that a digitized sound be played. *MovieSetter* is extremely flexible in this area; once you load a standard IFF 8SVX sound from disk, you can change its pitch and volume, specify which of the four internal voices to use, and even create a stereo panning effect. At any point you can also choose to cycle a specified range of colors, change palettes, or modify the frame display rate (to either speed up or slow down the animation).

Editing tracks is a breeze; all you have to do is advance the production to the desired frame, click on the face you want to edit, and make the change. Using the icons in the edit window, you can even cut, copy and paste tracks. If you want to change background pictures, you choose from six types of transitional wipes. A special window titled "Storyboard" provides some unique editing capabilities—it is essentially a pictorial database of your production. When this window is active, you can search your production for all frames in which a specified event occurs (e.g., a background change or sound event).

When you have finished your production, you can save it to disk in several ways. Normally, all that is saved is a small file which describes the production you created. The playback function actually reads that file and re-assembles the production. By choosing the Embedded Save option, that script file as well as all of the sounds, backgrounds and sets are saved on a disk. While this takes up a great deal of space, it is required if you intend to distribute your production. Finally, there is also an option to separately save all of the components of a production previously loaded from disk as an "embedded saved" file.

Perhaps the most difficult part of any program of this type is the actual creation of the animated characters which in all honesty requires a high level of artistic ability. While *MovieSetter* can't impart this skill in you, it does contain a graphics editor which facilitates the creation of sets. This window looks quite similar to several popular paint programs. On the

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by Russ Ceccola

A New Beginning

OK, folks, before we get down to business, I better explain about this column.

What is the purpose of this column? you might ask. It's real simple. To make you aware of the duds and the successes in the software world for the Commodore 64, Commodore 128 and Commodore Amiga series home computers.

Who am I to judge? you might also ask. Well, I've been writing for *Commodore Magazine* for almost three years and have been involved with software and computers since I was knee-high to a *Space Invaders* machine. Anyway, in simple language, I will try to assign a fair rating to as much new entertainment software as there is space for every month.

The software I'll be previewing will have been released just before the deadline for the magazine. There is a three-month lead time for the publication, so software highlighted in this month's column was actually released in March.

I've assigned a star rating to each program:

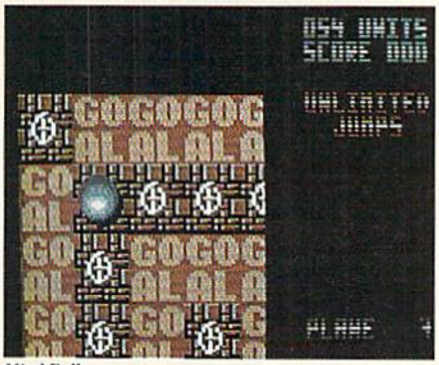
★ = poor
★★ = fair/average
★★★ = good
★★★★ = very good
★★★★★ = excellent

You won't see too many five-star ratings—simply because it's tough to make a program that is great all-around. The price mentioned is the suggested retail price. Any special memory requirements for Amiga products will be mentioned, but I'm assuming 512K and Kickstart 1.2 or greater. Let's get to some software.

By the way, feel free to write to me at:
Russ Ceccola
c/o *Commodore Magazine*
1200 Wilson Drive
West Chester, PA 19380

Mind-Roll ★★★½
Epyx, Inc.
600 Galveston Drive
Redwood City, CA 94063
Commodore 64: $29.95/Amiga: $29.95

I'm starting to get really sick of these bouncing ball programs, but the problem is that they just get better. *Mind-Roll* is one of those games in which you bounce a ball along platforms suspended in the air to try to get to the end of the course. It is also the best program of this type that I've seen released so far.


Mind-Roll

You roll the ball by pushing the joystick in any direction, and you jump by hitting the fire button. There are a lot of different objects on the tiled squares that make up the planes, from energizers and time boosters to lifts and teleports. In any case, *Mind-Roll* is fast and furious. There is no time for mistakes.

An added feature that makes *Mind-Roll* more interesting is that you can choose the order in which you visit the ten planes on a Designer screen. I went in numerical order because the higher-numbered planes are more difficult, but you have the option to do what you want. Also, each plane has its own personality based on the type of tiles prevalent and the "theme" of the plane. The graphics are very good on both versions, and the sounds reflect the happenings of the game. The only thing that is missing is a construction set option, so I can set up my own courses. Maybe next time . . .

Project Firestart ★★★★
Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Commodore 64: $29.95

As soon as I saw the press release headline "*Project Firestart* Combines Science Fiction With Horror Movie Effects"—I knew I was in for a treat. Boy, was I right! *Project Firestart* is a two-disk game in which you must find out what happened to the *Prometheus,* a research ship that is orbiting Titan, a moon of Saturn. The scientists on board were experimenting with genetics, and something went wrong. All kinds of flesh-hungry creatures are stalking the research ship now. You must search the ship and solve the mystery before a certain amount of time passes.

This adventure game is a lot like the hit movie *Aliens.* You have to go through the ship to find the answers to the questions and save a beautiful girl. Blood is splattered everywhere—a result of the creatures' attacks. *Project Firestart* is "filmed" like a movie too. I thought this was neat. There are close-ups, pans, fades, etc.

The manual contains a map of the ship that is tough to figure out—my only complaint about the game. The interface is easy to use, and the graphics are excellent. Another neat feature of *Project Firestart* is the music. It increases in tension as you get further in the game. The sound effects are great, too. If you put all of these elements together, you'll find that the package is worth the price of admission. Just don't turn your back to the creatures!

GoldRunner II ★★★½
Microdeal
576 S. Telegraph
Pontiac, MI 48053
Amiga: $39.95

This shoot-'em-up is the sequel to the popular game *GoldRunner* in which you destroyed the pirates on the Ring Worlds of Triton. It seems they've returned to try to take over the Ring Worlds once again. They are capturing your defense robots and reducing your ability to protect your fellow citizens. You have to fly the *GoldRunner II* fighter craft and shoot down all of the pirates that are taking the robots. You move from platform to platform, (platform = level in the game) collecting the robots and placing them in the mothership after all are brought together.

The neat thing about *GoldRunner II* is that the enemy ships' fire doesn't hurt you—it bounces you closer to certain buildings that will destroy you. I like the vertical scrolling and the quick game play. You have smart bombs to help you, and there is a tutorial that comes with the game.

The graphics and the game play are the strong points of this game. It takes a while to get used to the controls and what you can and can't run into on the platform. That's my only complaint—you can't just pop in the game without reading the manual and expect to get very far. Still, I have found *GoldRunner II* to be a very enjoyable arcade game. It's a real challenge to get those robots back from the pirates.

The landscape is colorful and detailed and the sounds in the game phenomenal, so turn off the lights and turn up the volume. There are all kinds of enemy ships to fight, so start remembering them from the first time you see them.

Galactic Conqueror ★★★★
Titus
20432 Corsico Street
Chatsworth, CA 91311
Amiga: $44.95

Titus' games get better with each release. *Galactic Conqueror* is no exception. All of the other Titus games required joystick skill and some aiming expertise. *Galactic Conqueror* requires one additional element that makes it so good—strategy.

In the center of the galaxy is the planet Gallion, the headquarters of the stellar league for the protection of mankind. Surveillance units have noticed a small invasion in a remote corner of the galaxy. It is your job to make sure that the invasion is stopped. You do this by choosing planets to liberate, after which they can help you destroy the enemy. The strategy lies in the choices you make. The fighting segments of the game are fast and furious. As with all other Titus games, the graphics and sounds are excellent. You'll find yourself speeding along in outer space shooting at enemy ships and trying to save different planets.

The manual is well written and includes pictures of all the major elements in the game (ships, meteors, planets, etc.). There are also examples of sticky strategic situations in the manual and suggestions for possible moves you can make.

There are over 416 planets for you to liberate in order to save the world from the alien invasion. The *Thunder Cloud II* is easy to handle, and you can expect to work hard to stay alive in this ship. In any case, the strategy and action combine well in *Galactic Frontier.*

F-14 Tomcat ★★★★
Activision
3885 Bohannon Drive
Menlo Park, CA 94025
Commodore 64: $39.95

Did the movie *Top Gun* make you want to be a navy pilot? Well, now is your chance to try out in the latest flight simulation game from Activision. *F-14 Tomcat* is more than just a flight simulator. The game puts you in the seat of one of a number of planes in one of 80 randomly assigned missions in five theaters of action: the Persian Gulf, Central America, Libya, Korea and Lebanon. The subtitle of *F-14 Tomcat* is "The Naval Fighter Weapons School Simulation." Once again, the game is more than just a flight simulator or combat flight mission game. You really feel as if you have gone through this school and are ready to take on the world.

Be careful, because the enemy planes are just as well prepared as you. To really get you ready, you will have to dogfight with other students in the Naval Fighter Weapons School. This practice is exactly what you need to survive in real combat missions. I have also found that *F-14 Tomcat* is a very addictive game. I keep on going back to the game every now and then when I want a challenge. The graphics are really clear and they make you feel as if you're in the pilot's seat. The action is fast, and the manual gives you all the details you need to know about the plane and performing aerial maneuvers. Plus, you have Admiral Hawk from the school chewing you out when you get too big for your britches!

Time and Magik ★★★½
Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
Commodore 64: $29.95/Amiga: $39.95

Text adventures are becoming a rare species in the computer gaming world. That is why it was so nice to see *Time and Magik* arrive in the mail. *Time and Magik* is a three-part text-and-graphics adventure that really tests your problem-solving abilities and intelligence. Each of the three parts of *Time and Magik* is an adventure unto itself. The only way for you to appreciate these games is to try them out yourself.

The three parts of *Time and Magik* are "Lords of Time," "Red Moon" and "The Price of Magik." Each has an interesting plot and can be played without any knowledge of the previous part(s), even though the same plot carries throughout all three.

In "Lords of Time," you must travel through time to stop the Timelord's attempts to alter eternity. In "Red Moon," you recover the Red Moon Crystal, the last source of magik after the destruction of the Lords of Time. Finally, in "The Price of Magik," you must recover the Red Moon Crystal from a madman in an old house who is using monsters to protect it. There is so much to do in these games that it may take months to finish all three parts—certainly worth your money. The graphics are excellent and the parser is pretty good, so don't expect too many problems. The biggest factor in *Time and Magik*'s favor (next to the great plot and many puzzles) is the inclusion of a clue book with the game. If you put all this together, you realize that you're getting a bargain.

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snapped, study the offensive formation and try to guess how the play will unfold. If you're in the right place at the right time, go for the interception or rush the quarterback for a sack. If you're in the wrong place, quickly switch control to the player nearest the ball. Attempt to drive the ball carrier into an obstacle and watch for fumbles. A sack in the end zone results in a two-point safety. Two levels of play—novice and advanced—are available in the game. This setting applies only to the offense. Curiously, it does not affect how well the teams perform, but rather how much control each player has over his or her team.

On novice-level offense, players begin by controlling the quarterback. Fade back, keeping in mind the defensive rush count, and allow the receivers to run their patterns. Holding the joystick in the relative position of your chosen receiver, press the button to pass. Joystick control is transferred only after the pass is complete.

Advanced-level offense allows you to select which player to control before hiking the ball. If you select quarterback, play proceeds as described above. If you choose one of the two receivers, you control that player's pass pattern. Press the fire button to signal the quarterback to pass the ball to you.

Although this is primarily a passing game, players can also run, but with less chance for success. Quarterbacks may break the line of scrimmage, but prepare to draw a crowd. One type of play unique to this game allows lateral passing. During play execution, this means the quarterback can lateral the ball back to a receiver and run down field as an eligible receiver. Likewise, runners about to be tackled can lateral back to a teammate for extra yardage. What seems like a small detail adds extra kick to the game.

The otherwise excellent instruction manual falters a bit when explaining how to keep your play selection secret during two-player games. The manual goes into some complicated nonsense about making false joystick movements to confuse your opponent. Forget it—you'll only confuse yourself. The only way possible is to have the other player turn their head. Simple, but effective.

I consider myself a diehard computer football fanatic, and I like *Street Sports Football* a lot. It doesn't pretend to play by official rules, but in backyard sports, nonconformity is the name of the game.

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by Robert W. Baker

Welcome to My World

Explore the inner workings of the Q-Link telecommunications service with network pro Bob Baker.

The People Connection is one of Q-Link's most active areas. It's much more just than a "party line" or a place to meet other users. PC is also your gateway to playing interactive online games or to attending special events in the auditorium. Plus you can create your own "rooms" for get-togethers with friends, meetings for clubs or organizations, and more. It's all just a few keystrokes away!

When you first enter People Connection you usually wind up in the Lobby. This is the central hub of People Connection, and everyone enters through this "room" before selecting their final destination. Keep in mind that there may be several Lobbies that are automatically created, since each room or lobby can hold only 22 people. You can easily determine where you are by looking at the room name displayed at the top of your screen whenever you enter a room. Occasionally, there might be an extra letter or number displayed after the word "Lobby" if you wound up in one of the alternate lobbies when the main lobby is full.

If you entered PC and expected to meet someone in the Lobby, be sure to check the room name to see where you landed. If you're in a different room, then you can use E-Mail or online messages to contact the other users and pick a new meeting place. The best idea is to create your own room and let everyone else know where to go. The lobby is usually just too busy to have any sort of conversation with someone anyway.

Always remember that you can press F7 anywhere in People Connection to access the menu to move to various rooms, see who's in a room, identify a user, send mail, move to another area of Q-Link or leave PC, etc. Also, you'll see a list of user names displayed at the top of your screen along with the current room name, indicating where you are and who else is in the room with you.

When you're in the Lobby, or any of the public or private rooms, whatever you type on your keyboard is entered into the input buffer at the bottom of your screen. This text is transmitted to everyone in the same area of PC when you press your RETURN key. If you make a mistake, you can press the CLR key to erase the current contents of the input buffer—but only before you press the RETURN key.

As you type, the text scrolls to the left in your input buffer to allow entering a reasonable size message. If you need to, you can use the cursor left or use the HOME key to go back and edit earlier text. The INSert and DELete keys work as expected, or you can simply retype the text and overwrite the original contents. However, once you press the RETURN key it's too late to make any changes; there's nothing you can do with the text you just entered.

As I mentioned, the input buffer scrolls to allow entering longer text than can fit in the single-line input buffer. However, each line of text that's displayed in the room or lobby is typically shorter than your actual input buffer. So, the text is automatically wrapped on word breaks by the system and may in fact take up several lines on your screen when it's displayed. This is sometimes used to create very fancy and interesting graphics online. In fact, there are a number of users who spend a lot of time experimenting with this to see what they can create. If you're interested, there are several text files available online that describe this unusual art form and how it's created.

There have been a number of new online games added over the past months, including Boxes and others that I've mentioned in past columns. These are in addition to the original games and the Rabbit Jack Casino that are all accessed through People Connection. Most of the games are designed for two or more players, but the system can help locate an opponent for you if you need one. Just about all of the games feature graphics, sound effects and even a chat mode to talk with your opponent while you play. If you want to play, give it a try and don't be bashful. And if you like competition, watch for announcements about online game tournaments and special games with all sorts of prizes.

Speaking of prizes, don't forget that there is almost always some sort of prize given at each auditorium event. If you attend one of these events and stick around long enough, you might just get picked for free plus time, software, magazine subscriptions and more. Some of the prizes are actually points or coupons that you can save and accumulate, or cash them in for all sorts of things. All you have to do is be in the auditorium when they pick the winner! Entering the auditorium is just like going to any other room, but the system is slightly different once you're inside.

Each auditorium event is hosted by one or more auditorium masters who control the flow of events. You'll see the names of the auditorium masters displayed at the top of your screen instead of the names of other users in the auditorium. To find out who is in the auditorium, you'd have to leave the auditorium and use the menu options that let you see who is in a given room. This will let you see who is in the auditorium too.

Whenever you enter the auditorium you become a spectator and can normally only participate by the "Ask a Question" function available in the Auditorium Menu. To access the menu, simply press F7 and you should see the entry for asking questions and more. The auditorium masters can also invite users to come "on stage" and actually participate live. When this happens, any question you enter is automatically displayed in the auditorium instead of going into the normal question queue.

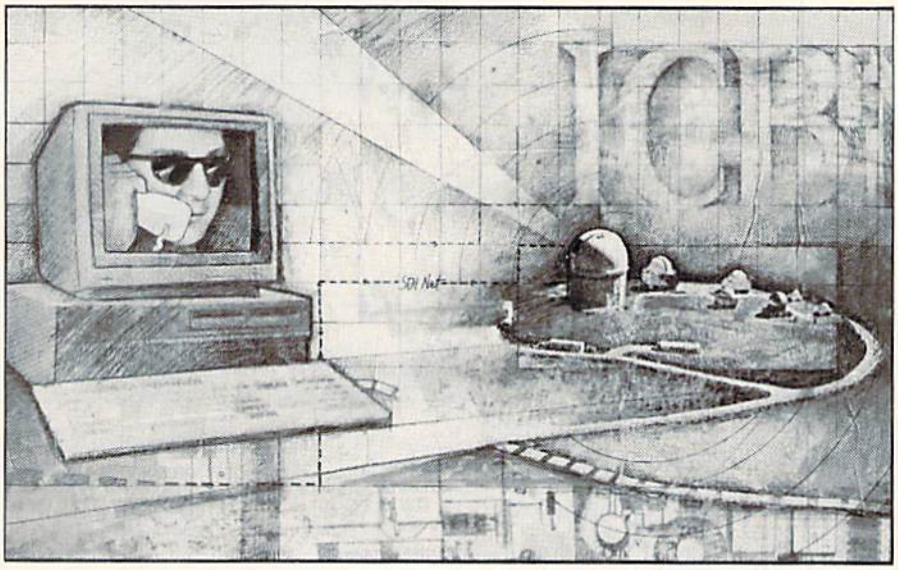
There may be many people asking questions at the same time, and the auditorium masters have to process the questions one at a time in the order they were entered. They have to display a question to read it, decide to post or discard the question, and then enter their response. This process may take several minutes, especially if one of the auditorium masters has a slow input node to the system. So try to be patient, it might just take a little while for your question to be handled in an active auditorium event. If you have to leave early, you may want to check the auditorium archives when they're available. You may just find that your question was eventually answered.

Besides the typical question-and-answer auditorium events, there are all sorts of forums, game shows, talent nights, talk shows and more. Be sure to check your issue of the Q-Link Update magazine or the listings of coming events posted in the online Customer Service area. You may get a chance to talk directly with the design engineers at Commodore, some of the soft-

Continued on page 86

by Howard Millman

System Crackers Indicted for Espionage



MIA BOSNA

Three West Germans were arrested in what may become this decade's most serious case of computer espionage. Allegedly paid hundreds of thousands of dollars by the KGB for their information, the three men used computers and modems from their homes in Hanover, West Germany to access U.S. military computers worldwide. Their success threatens to undermine the effectiveness the U.S. espionage network.

First recruited by the KGB in 1985, the crackers gained access to the United States Department of Defense Optimus military database, a NASA database as well as computers dedicated to nuclear weapons research in Los Alamos. Reportedly, the Soviet agents also received passwords and classified materials illegally downloaded from military and commercial databases in West Germany, France, Switzerland, Britain and Japan—all by modem from computers located in West Germany.

The trio smuggled disks containing the classified data into East Berlin. There they met with two Soviet agents who reportedly paid them $3000 per disk. Gerhard Boeden, president of West Germany's Federal Constitutional Protection Office and Chief of Domestic Counterespionage said that existing computer systems are "not sufficiently" secured. He added, "If current suspicions are confirmed, what we surely have is a new quality of espionage."

Investigators in Bonn, West Germany believe there may be as many as eight other conspirators involved, more arrests and indictments are expected.

Truth Stranger Than Fiction

The crackers' activities were first spotted by an alert 30-year-old Cambridge, Massachusetts astronomer. Clifford Stoll noticed a seventy-five cent discrepancy in his online access account at Lawrence-Berkeley Labs. "If it had been $1000 off, I wouldn't have thought anything of it, it's the little problems that are the most fascinating," said Stoll. Intrigued, he investigated and discovered the illegal system access.

Randomly, over the next four months Stoll watched what the intruder typed in. The cracker, according to Stoll, was "searching for keywords like *ICBM, SDI, Norad* and *nuclear.*"

Initially, the FBI discounted his warnings. Stoll then planted fictitious information, details of a nonexistent database called "SDI Net." Three months later, when a suspected KGB agent contacted Stoll to verify the information, the FBI moved in.

His adventure isn't quite over yet—there's obviously more to tell. Before astronomer Stoll turns his attention back to the stars he has contracted to write a book about his experiences. ■

Win, Lose or Draw

Continued from page 23

excitement of the TV show. In fact, having real teams around the computer with team captains who do the typing adds a new level of excitement. Team members yelled answers and got into the same heated frenzy as they do when playing for valuable cash prizes on the TV show.

Captains should be chosen based on their ability to type quickly. Team play is also interesting because everyone sees the drawn object a little differently. The drawn objects are excellent, but one player may see the result before another.

It's a Win

I have a marketing idea for Hi Tech Expressions. They should start producing more puzzle disks now. There are plenty of puzzles on the second side of this two-sided disk, but I am sure that this program will become so popular that more will be needed. Additional disks would lengthen the life-span of this very worthwhile program.

I predict that *Win, Lose or Draw* will be popular with many age groups. I tested it with children as well as adults, with the same resounding success and approval. This game is challenging and makes a great survival kit to perk up parties. ■

The Write Stuff 128

Continued from page 24

corporating nearly every imaginable typesetting effect.

Also available at minimal extra charge is "BB Talker 64," a "talking" version of "BB Writer 64" featuring *S.A.M. (Software Automatic Mouth)*. The program comes with over 30 nursery rhymes, fables, songs and fairy tales. *S.A.M.* is easily controlled through a menu system or embedded commands, enabling you to create audio text previews.

Finally, Busy Bee offers a Quick Brown Box version of *The Write Stuff 128*. This is a 64K battery-backed CMOS RAM cartridge that autoboots in seconds. Alternate versions boot the program from disk and use the cartridge's entire memory as a non-volatile text area.

Word processors give true meaning to the term "personal software." Most people learn to use one and then find it difficult to switch, even when the program has outgrown its usefulness. *The Write Stuff 128* invites users of all levels to explore the possibilities and grow together. Its open-ended architecture and extensive user support assure long, productive relationships. ■

**Also available for the Commodore 64.*

by John Iovine

X-10 Power Line Interface
for the Commodore 64 and 128

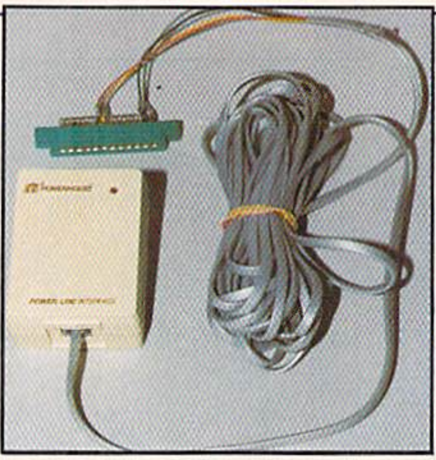
Regular readers of this column may remember an appliance controller we built some time ago. The controller allowed one to power 120-volt standard household appliances or equipment with the user port. This controller has a few major inconveniences that didn't allow one to fully implement home power control. Mainly the power lines to the equipment had to be coupled to the user port. This created the hassle of running power line wires through the computer's user port to the equipment. I don't imagine many people ran secondary power lines through their homes to control a few appliances.

This project alleviates those problems. We will build and install an X-10 home control system. The X-10 control system uses the house wiring for both control power and signal transmission. A module connected from the computer into a wall socket forms the computer controller to power line interface. At the other end of the system is a receiver module plugged into a wall socket that has the appliance to be controlled plugged into it. The computer signals through the interface via the house wiring to the receiver module to turn the appliance on or off.

A tremendous advantage to this system is that the receiver modules are available at a number of retail stores throughout the country. Radio Shack's Plug and Power and Sears' Home Control System are both X-10-based systems packaged under different names, and both are compatible. These inexpensive modules cost approximately $12 each. Each receiver module can be assigned one of 256 discrete address codes. This allows us to use 256 discrete modules throughout the system.

How the X-10 System Works

The X-10 is a current carrier communication system. The transmitter impresses 120 kHz pulses onto the 60 Hz power line cycle that are received by the remote appliance modules. The controller for the transmitter—in this case the Commodore 64 or 128—codes the pulses to activate a particular module and control function.



As stated earlier, one X-10 system can control up to 256 discrete receiver modules.

Pulse transmission is sent right after zero crossing on the 60 Hz power line (see drawing). Zero crossing means what its name implies. It is when the 60 Hz sine wave that makes up the AC power line in your home crosses the 0 volt as shown in the drawing. The 120 kHz pulse must be sent within 200 usec of zero crossing and held for one millisecond. The reason the pulses are sent right after zero crossing is that this is the quietest moment on the power line, which helps reception of the signals at the receiver modules.

The pulses and absences of pulses on the 60 Hz power line at zero crossing points are interpreted as the familiar binary 1 and binary 0, respectively. These binary signals are coded to build a 22-bit control sequence command.

X-10 Codes

All X-10 code sequences begin with a 4 bit Start Code:

START CODE "1 1 1 0"

This is followed by a letter house code and key code.

HOUSE CODES:		KEY CODES:	
A	0110	1	01100
B	1110	2	11100
C	0010	3	00100
D	1010	4	10100
E	0001	5	00010
F	1001	6	10010
G	0101	7	01010
H	1101	8	11010
I	0111	9	01110
J	1111	10	11110
K	0011	11	00110
L	1011	12	10110
M	0000	13	00000
N	1000	14	10000
O	0100	15	01000
P	1100	16	11000

FUNCTION CODES:

On	00101	All Units Off	00001
Off	00111	All Lights On	00011
Dim	01001		
Bright	01011		

True Complement

The house codes and the key codes follow a procedure of true complement, meaning that when a bit is transmitted it is followed by its inverse form at the next zero crossing. So a binary 1 is followed by its inverse form binary 0 at the next crossing. This isn't as difficult as it may appear. Let's look at the house code for A that is equal to binary 0110. Using the true complement described we expand the binary number to 01 10 10 01. Our basic program does this for us, but this information is important to understand how the system operates.

Code Transmission

Transmission of the code follows this procedure:

1. Start Code
2. House Code
3. Number Code (Key Code)

Repeat three steps above, wait three power cycles, then continue.

4. Start Code
5. House Code
6. Function Code (Key Code)

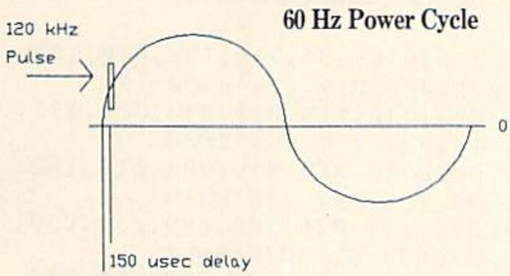
Repeat three steps above, wait three power cycles, then continue.

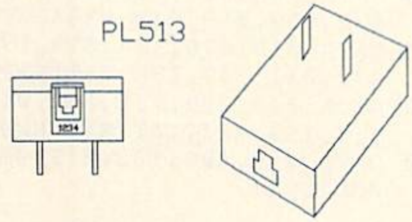
Points to remember: the start code is transmitted as seen, there is no true compliment with the start code. The house and key codes are true compliment. Repeat each three-step code once, wait a minimum of three power cycles between the three-step codes transmission. In addition, when using the bright or dim functions, transmit the function section only once.

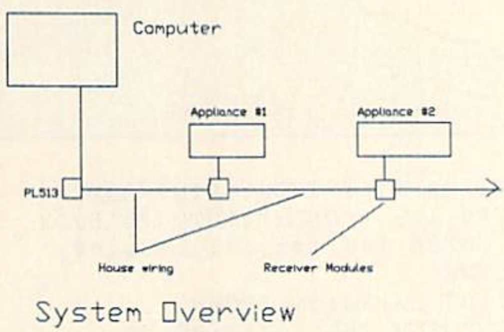
Again our program handles all these conditions required by the X-10 system; I'm going over it so that you understand how the system operates.

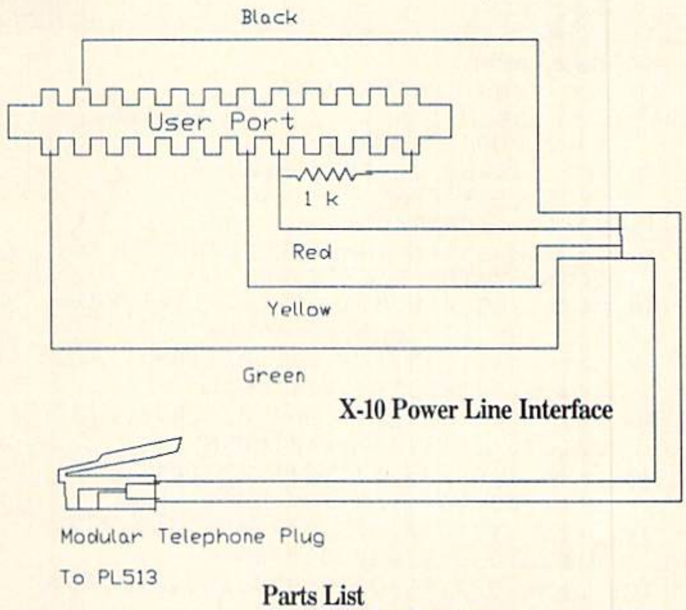
PL513

The PL513 power line interface module plugs into a wall socket and is connected to the user port via a standard telephone line. The modular plug at the end of the telephone line plugs into the PL513 module. The other end of the telephone cord that has spade lugs are soldered directly to the user port card connector (see schematic). Before I soldered the wires to the









Parts List

PL513 Power Line Interface $14.00
Telephone Cord Radio Shack #279-310 $12.95
Card Connector Digi-Key (As Had Last) $ 4.95
X-10 Appliance Module $12.95

X-10 Appliance Modules are available from Images, Radio Shack, Sears and a number of retail outlets.

X-10 Appliance module Radio Shack #61-2681

Images Company
P.O. Box 313
Jamaica, NY 11418
Orders to Images add $2.50 shipping and handling. NY state residents add 8.25% sales tax.

card connector I cut one ear off the spade lug (see photo).

The PL513 has a zero crossing detector and a 120 kHz signal generator. This makes interfacing our computer pretty easy. The machine-language (ML) portion of the program listens to the line and outputs a one millisecond bit at zero crossing. The coding is handled by the basic program based on your responses, before calling the ML program.

Program

You'll notice the basic program contains only four house codes and four code numbers for a total operation of 16 discrete modules. I did this to keep the overall size of the program short. I don't think anyone will need to use 256 discrete modules right off the bat.

However, with a little analysis you will see that it is very easy to add additional house codes and numbers. The program adds the true complement to the binary codes, which simplifies your involvement to copying the additional codes from this article into the program.

When you run the program, it queries you for the house code, unit number and function, then jumps to the ML program to initiate the function. Upon completion ML jumps back to the BASIC program. The house codes and unit numbers are adjustable on the front of the appliance controller.

Going Further

The programs with this article give you basic control of the X-10 system. You can modify the basic program to send various codes depending upon external events, like sensor input. This is similar to the automatic ventilation project we constructed previously using the toxic gas sensor.

You may notice that the two PB lines off the user port we are using this month are the two uncommitted lines left on the telephone answer and DTMF decode project from last month. This enables you to merge these two projects to give you a remote telephone home control system. Also, if you currently have a telephone answering machine, you can eliminate the ring detector and phone line pickup from last month's project and just use the decoder section in conjunction with the answering machine. That way you can receive messages and/or enable appliances remotely. That may be useful for things like turning on an air conditioner in the summer via the telephone before leaving work so your home will be comfortable on arrival.

The X-10 system is still under development. Although we have only dealt with the basic 120V appliance receiver modules, X-10 also manufactures wall switches, three-way switches, lamp modules, etc. that are all compatible with our interface. Currently the X-10 Company is developing smart receiver modules that report back to the main controller their current status (on-off), and have a few additional functions. So we can look forward to adding new types of modules to our X-10 system in the future.

Amiga Interface

In an upcoming issue I'll write an X-10 interface for Amiga computers.

X-10 Basic Loader

```
10 REM JOHN IOVINE'BKKA
15 REM BASIC LOADER FOR ML ROUTINE
   X-10 PROJECT'BJYM
20 FOR I=4864 TO 5026:READ A
   :POKE I,A'FPAE
25 CS=CS+A:NEXT'DGHG
30 IF CS<>15116 THEN PRINT"ERROR IN
   DATA STATEMENTS"'FHWK
50 DATA 169,016,013,001,221,141,001,
   221,096,173,001,221'BWPK
60 DATA 041,239,141,001,221,096,142,
   163,019,162,197,202'BWQL
70 DATA 208,253,174,163,019,096,173,
   001,221,041,032,240'BWNM
80 DATA 249,096,173,001,221,041,032,
   208,249,096,189,164'BWON
90 DATA 019,240,015,032,000,019,032,
   018,019,032,009,019'BWXO
100 DATA 032,018,019,032,000,019,032,
    018,019,032,009,019'BWAE
110 DATA 232,096,234,234,162,000,160,
    000,032,038,019,224'BWDF
120 DATA 022,240,015,032,030,019,032,
    046,019,032,038,019'BWXG
130 DATA 032,046,019,076,083,019,162,
    000,200,192,004,240'BWFH
140 DATA 234,192,005,240,009,032,030,
    019,032,038,019,076'BWLI
150 DATA 104,019,232,224,004,240,009,
    032,030,019,032,038'BWVJ
160 DATA 019,076,122,019,173,162,019,
    208,011,169,186,141'BWFK
170 DATA 047,019,238,162,019,076,076,
    019,169,164,141,047'BWVL
180 DATA 019,206,162,019,096,234,
    000'BCII
```

END

X-10 Control Program

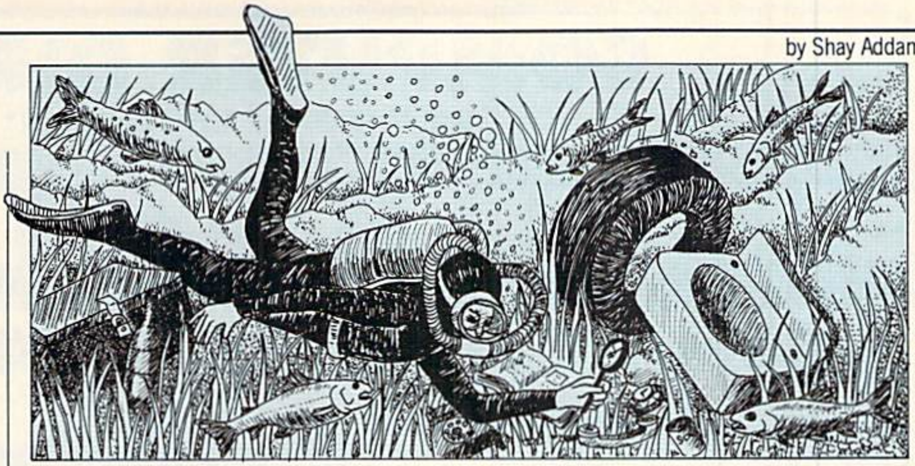
```
6 SA=5032:POKE 5027,0:POKE 5026,0
  :POKE 56579,16:POKE 56577,0'FMEO
7 POKE 5028,1:POKE 5029,1:POKE 5030,1
  :POKE 5031,0'ECWM
8 POKE 5050,1:POKE 5051,1:POKE 5052,1
  :POKE 5053,0'ECUN
9 PRINT"[CLEAR,DOWN7]":PRINT"ENTER
  HOUSECODE FOR X-10 MODULE":PRINT
  :PRINT'EDDT
12 PRINT" 1) = A[SPACE16]3) = C"'BATD
15 PRINT" 2) = B[SPACE16]4) = D"'BAXG
36 PRINT:PRINT:INPUT"ENTER NUMBER
   1-4";X'DEDL
39 IF (X<1 OR X>4)THEN PRINT"ENTER
   NUMBERS 1 - 4 ONLY":GOTO 36'HJUU
42 ON X GOSUB 100,101,102,103'CQRG
45 PRINT"[CLEAR,DOWN7]"
   :PRINT"ENTER MODULE NUMBER":PRINT
   :PRINT'EDWO
48 PRINT" 1) = 1[SPACE21]3) = 3"'BAQN
51 PRINT" 2) = 2[SPACE21]4) = 4"'BAUH
54 PRINT:PRINT:INPUT"ENTER NUMBER
   1-4";X'DEDL
57 IF (X<1 OR X>4) THEN PRINT"ENTER
   NUMBERS 1 - 4 ONLY":GOTO 54'HJUU
60 ON X GOSUB 120,121,122,123'CQAG
63 PRINT"[CLEAR,DOWN7]"
   :PRINT"ENTER FUNCTION":PRINT
   :PRINT'EDUN
66 PRINT"1) = ALL LIGHTS OFF[SPACE3]
   4) = OFF"'BANP
69 PRINT"2) = ALL LIGHTS ON[SPACE4]
   5) = DIM"'BAIS
72 PRINT"3) = ON[SPACE15]
   6) = BRIGHT"'BACL
75 PRINT:PRINT:INPUT"ENTER NUMBER
   1-6";X'DEFO
78 IF(X<1 OR X>6) THEN PRINT"ENTER
   NUMBERS 1 - 6 ONLY":GOTO 75'HJCX
81 ON X GOSUB 140,141,142,143,144,
   145'CYWK
93 D$=A$+B$:E$=A$+C$:'EOWN
96 F$=D$:GOSUB 200:Y=Y+4:F$=E$
   :GOSUB 203'GVPT
99 SYS 4940:GOTO 3'CGAQ
100 A$="0110":RETURN
    :REM HOUSE CODES'DOUB
101 A$="1110":RETURN'CDPX
102 A$="0010":RETURN'CDNY
103 A$="1010":RETURN'CDOA
120 B$="01100":RETURN
    :REM NUMBER CODES'DPOD
121 B$="11100":RETURN'CDPA
122 B$="00100":RETURN'CDNB
123 B$="10100":RETURN'CDOC
140 C$="00001":RETURN
    :REM FUNCTION CODES'DRPG
141 C$="00011":RETURN'CDPC
142 C$="00101":RETURN'CDPD
143 C$="00111":RETURN'CDQE
144 C$="01001":RETURN'CDPF
145 C$="01011":RETURN'CDQG
200 Y=0'BCIW
203 FOR X=1 TO 9'DDCB
206 L$=MID$(F$,X,1)'CKKF
209 IF L$="0"THEN POKE SA+Y,0:Y=Y+1
    :POKE SA+Y,1'JRBP
211 IF L$="1"THEN POKE SA+Y,1:Y=Y+1
    :POKE SA+Y,0'JRCI
213 Y=Y+1:NEXT:RETURN'EFTD
```

END

by Shay Addams

Fishing for the Death Angel with a Magic Candle

News and opinion from a leading explorer of those fantasy realms called adventure games.



DENISE FALESKI VITOLLO

What does a columnist do when he can't decide which game to mention in the name of the column? Put them *all* in, as I did this month. (At least I had the good sense not to combine the reviews.) Since they're both graphic adventures, let's look at *FISH* and *Police Quest II: The Vengeance* first.

For the Commodore 64 and Amiga, *FISH* is from Magnetic Scrolls, who did *The Pawn* and *Guild of Thieves*. It's their strangest story yet, casting you in the role of an interdimensional secret agent who warps from one world to another to fight wacky terrorist groups like the Seven Deadly Fins. In the first scene, however, you find yourself in a fishbowl—and in the body of a fish!

Due to job-related stress, the only way you can relax after a mission is by warping into the body of a fish and floating around in the bowl. Not for long though, for your boss—Sir Playfair Panchax, who heads up the spy agency where you work—soon informs you the Seven Deadly Fins have launched another of their riotous rampages. Then three "warps" appear in the bowl. Upon entering one, you'll be warped into the body of another being (human, thankfully) in some faraway locale: a recording studio, a forest, or the back of a British rock group's van. In each location you've got to solve several puzzles in order to obtain one part of a device. Fail to unravel the main riddle in time, and you'll be zapped right back to the bowl. I imagine most people will prefer this "back to square one" approach over being killed for making a mistake.

After solving each warp's central puzzle, you'll use the three items to build a device that opens a major warp to the world of Fish. Here you've got to foil those felonious Fins before they destroy this watery world, which means you'll have to dredge up several more objects and construct another device. Like Magnetic Scrolls' previous adventures, this one features lots of clever and logical puzzles; hints are hidden in the text, not the pictures. The graphics reflect a more contemporary style than those in other games from this outfit, but even so, *FISH* is more of an illustrated text adventure than a graphic game—there are just a few dozen pictures, so each one stays on screen through a number of moves to the new locations. If you're looking for laughs along with your logical puzzles, I suggest you go *FISH*ing soon. Each chunk of text and line of response from the parser is riddled with the bizarre sense of humor that has become Magnetic Scrolls' hallmark.

Trolling for the Death Angel

Amiga detectives can also "fish" for clues in *Police Quest II: The Vengeance,* in which several important tips lie at the bottom of a lake and can only be recovered by scuba diving. The goal is to recapture Jesse Bains, who escaped the jail cell you put him in at the end of *Police Quest I* (you *did* nail him in the game, didn't you?)

Several aspects make the sequel superior to the original. The arcade sequence, in which you steered a little car around an aerial-view map of the town was replaced with an animated sequence that shows a first-person view through the car's windshield—no more wrecking that little car and having to start over every two minutes. If you're one of those who would have groaned at the idea of playing yet another of the card games that have been a key part of so many Sierra adventures, you'll be relieved to hear the poker game from *Police Quest I* was replaced with an animated sequence in which you visit a firing range and practice adjusting the sights of your pistol until you're a crack shot. This skill proves crucial later in the game.

It's also harder to solve than *Police Quest I,* which most gamers will appreciate. Toting your field investigation kit from one "scene of the crime" to the next, you'll use it to obtain fingerprints, get blood samples and make a plaster cast of a footprint—evidence that ultimately leads to Bains' apprehension, which takes you out of town this time.

Graphics and sound effects make even more of a splash than in the original, for Sierra's new development system presents the story with double the resolution and much better music and more authentic noises. Animated effects, such as smoke from your partner's cigarette, lend an atmospheric touch to the tale. The parser has also been improved. if it's a contemporary setting you seek for your next quest, this is one of Sierra's best.

(Gold Rush is also out for the Amiga, but it employs the old game system and is best suited for those intrigued with the history of the Old West.)

The Magic Candle: We Drip No Wax Before Its Time

The six-character role-playing game held my interest much longer than many of the other RPG's whose designs were influenced by *Ultima.* It poses an original quest: to prevent the demon Dreax from escaping a Magic Candle where it's been imprisoned for centuries. The Candle's guardians have disappeared, and since it was their magic that kept the Candle from burning down, it's only a matter of time before Dreax once again ravages the fair land of Deruvia. Your choice of three difficulty settings determines how much time you get: 1,000 days with the easy setting, 800 at intermediate level and 600 for difficult. Each move eats five seconds of game time, so count on at least 100 hours to finish it, even at the easy level.

It's a Commodore 64 program (no plans for an Amiga version) that blankets four disk sides. The second game by Ali N.

Continued on page 89

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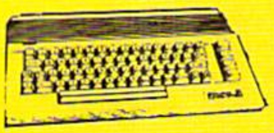
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by Mark Jordan

Spreading the GEOSpel

Berkeley Softworks' series of GEOS-compatible products opens up a world of opportunity to Commodore users. Take some tips from Mark Jordan and soon you too will be Pumping GEOS.


MIA BOSNA

All non-GEOS users—Halt! I repeat, all non-GEOS users, halt. Do not try to escape from this page. You are surrounded. (There one goes! BAM! Got'm.) It could be very dangerous for you to try to flee.

Strange opening. Chances are, if you're reading this column, you are a GEOS user. So why start out with a melodramatic attempt to arrest a bunch of people who may not even read this piece? Have I forgotten my true audience?

No. I started out that way to get *your* attention. Perhaps many of you don't realize the need to go to war for GEOS. It's time to put an icon on every screen, a mouse in every hand. Because the more people use GEOS, the more activity in the GEOS world. And where there is activity, there is money. And where there is money, there is commerce. And that all equals up to faster and better GEOS products. So it is in our own interest to proselytize, propagandize, convert, and, if need be, use physical force to get more people using GEOS.

This article is dedicated to that end. I will share with you the fine art of brainwashing people into using our favorite graphics interface. First we will work from the defensive end, parrying every argumentative thrust that a non-user might jab at us. Then we will go on the attack, slicing and dicing our victim into submission. For those faint of heart or weak of stomach, be prepared: this could get bloody.

Ready? Grab your saber and pay attention.

First Attack: Who Needs a Graphics Interface, Anyway?

This is the first thing most non-GEOS users will say to you. You need to know how to show them that they do. Start with an explanation of the theory behind the graphics interface. Here is that theory, as briefly as I can tell it:

The graphics interface is based on a time-honored concept of human learning: the metaphor. A metaphor is nothing more than a comparison. All of us mere mortals try to understand new things in terms of things we already know. And most mere mortals know what a desktop looks like. We know what file folders are. We are quite familiar with wastebaskets. By turning the computer screen into a type of desktop, we users intuitively have some idea how to go about things.

Say this to a non-GEOS fan and be prepared for a sudden thrust from below: "Fine, but I know my system, inside and out. I don't need any metaphors."

Deflect it by pointing out to your opponent that he may not need one now, but he will someday. Point out that all new computer systems are sporting some sort of graphics interface from the Amiga to the Mac to NeXT. Even MS DOS is attempting to join the fray.

Be prepared for a second, quick underhand jab: "But I'm not changing systems. I will be buried with my 64 in the coffin next to me."

A surprise move is useful here—agree with him. Praise him for his loyalty. Then, while he's basking in glory, use the Grippo Reverso: nonchalantly ask him if he's ever changed word processors. He will snort, caught off guard, yeah, he's changed and it ain't worth it. Now advance with El Sneak Commento: "Yeah, wouldn't it be nice if they all were based on some standard?" As he snorts again, use the Double Whammy to add, "Of course, if we wait on the competing software companies to establish the standard, it may never happen. What we need is a standard based on something that transcends capitalism." Then quietly, subtly add, "Like a metaphor." He will nod in agreement before he realizes you've drawn blood.

Second Attack: It's Too Inconvenient

At this point the non-GEOphyte will slip into the "It's too much bother" line of attack. He'll usually start by saying, "Who wants to wait two minutes to boot GEOS up every time you turn the computer on?"

This is a tough move to defend against. None of us enjoys waiting for GEOS to boot up. It takes three quick, slick moves to thwart this one.

First, we must employ the Kebab Strategy (you know what kebabs are—meat skewered on a rod): we must let his saber spear not only GEOS but also all other software in the process. Do this by saying, "Yeah, I hate loading programs." Then deftly shift footing by reminding him of how bad it used to be back in the days of loading with cassette tapes (most GEOS opponents have been around since the cassette days). Finish the maneuver and turn the entire situation in your favor by remarking how Berkeley's quick disk routines are so effective.

Don't expect him to drop the inconvenience strategy yet. He will counter with a now-famous lament: "I hate taking my hands off the keyboard to pick up a mouse." Again, his shot is well-aimed: touch-typists (I'm one) hate, I mean HATE, lifting their fingers off the home row. Just typing numbers puts us in bad moods.

But this blow can be met head on. We simply inform our opponent that he is behind the times. Yes, in version 1.0 days there weren't many keyboard options. But no more. In version 2.0 all but two alphabetic keys used with the COMMODORE key do something (see Pumping GEOS document).

"Well," he'll say, "what about drawing, you've got to use the mouse for that." A

Continued on page 88

Pumping GEOS

Vol. 1, Num. 11

Little Known Facts About GEOS 128 Version 2.0

By now I'm sure you've heard about version 2.0 of GEOS 128. You probably know about most of the new features that are offered. But there are a few little extras that come with the system that you may not know about.

One of the nicest of these is the extra printer drivers that have been added: double-strike, quad-strike and a reducing driver are available for some printers. The double-strike and quad-strike drivers print darker and fill in the voids around dots. The improvement in printing quality is quite significant (though it does take longer). The following printers are supported: ImageWriter, Epson FX-80, MPS-1200, C.Itoh 8510, IBM 5152, Star NX-10, and Gemini.

There are only two reducing drivers so far : C. Itoh and Epson. However, these are two of the most common printer formats so many others will likely be able to use them. The C. Itoh driver reduces a page to 50% its original size while the Epson does a 66% reduction.

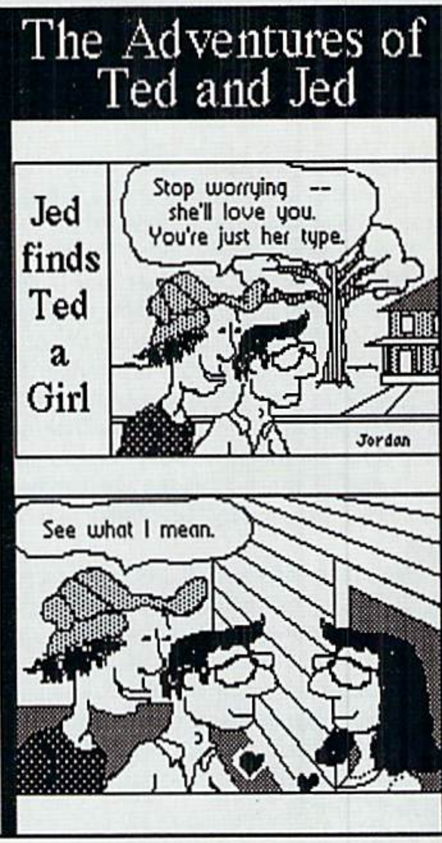
Another little-known feature on 2.0 is the ability to select a group of files with the mouse. To do so, move the pointer to the first file icon you wish to select, hold down the Commodore key, click and drag. A rubber-band rectangle will appear. Once you've encompassed the files you want, click again.

Finally, tons of keyboard shortcuts have been added (see below) along with many other small conveniences that make using the system so much easier.

Desktop Shortcuts

The manual and addendum for the 128 version 2.0 don't list the keyboard shortcuts for the Desktop in alphabetical order so I'll do that for you. As always, the Commodore key must be held down with the shortcut key.

A -- Open disk drive A
(Shift) Switch dr. C to A
(Ctrl) Copy files to dr. A
B -- Open disk drive B
(Shift) Switch dr. C to B
(Ctrl) Copy files to dr. B
C -- Close disk
D -- Delete file
(Ctrl) Move files to border
E -- Erase disk
F -- Format disk
G -- View 1st file selected
H -- Duplicates file
I -- Select input driver
J -- (none)
K -- Copy disk
L -- (none)
M -- Rename file
N -- Rename disk
O -- Open disk
P -- Print file
Q -- File info
R -- Reset desktop
S -- Add note pad page
T -- Delete notepad page
U -- Undo delete
(Ctrl) Move border files
V -- Validate disk
W -- Select all files on disk
X -- Select all files on page
Y -- Select all border file
Z -- Load current file



Hacked and Ready to Pump

The GEOS world is finally starting to be populated with programs from outside the parent company. In other words, hackers are hacking at last. Here's a brief look at three programs I've come across that have made my life a lot better.

Quickview, by Bill Sharp (PO Box 7533, Waco TX 76714). This application allows you to take a look at your Write files from the desktop. It is very useful for seeing what's on that old file you forgot about and for reading documentation for new programs. Highly recommended.

Album Animator, by Dennis Seitz. This shareware product ($5.00 -- 7137 Snake Rd., Oakland CA 94611) will animate Photo Albums. I got a couple of impressive demos, one of a young lady taking a stroll. You can set the animation speed. Lots of potential fun in this one.

Dump and Double-Dump, by Doug Fults. These two let you dump your screen to the printer. Used with the Paint Drivers, you can convert your desktop into a geoPaint file. Quite useful for illustrating articles about GEOS.

Continued from page 11

BINARY	HEX	BINARY	HEX
0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

Once you know these four-bit conversions, converting a longer binary numeral is simple: just divide it into four-bit groups and write the hex equivalent for each group. Here are some completed conversions; use this chapter's base conversion programs to prove that they are correct:

1000 0000 binary = 80 hex
1000 0000 0001 binary = 801 hex
0001 0010 1101 1100 binary = 12DC hex
1010 1010 1010 1010 binary = AAAA hex

A. W. Grym
London, England

Telling Numerals Apart: Since binary, hex and decimal numerals use many of the same symbols, it can be difficult to tell which base a numeral is expressed in.

If you see the numeral 1000, for example, how do you know whether it's decimal, binary or hex? If it's decimal, it's one thousand. If binary, it's eight. If it's hexadecimal, it's four thousand ninety-six. Those are very dissimilar numbers!

When confusion like that is possible, it's good practice always to specify the base of the numeral in question. There are a half dozen widely used conventions for making the distinction, but only three are common in the Commodore world.

First of all, the name of the base can be spelled out next to the numeral. "1010 binary" isn't likely to be confused with "1010 hex."

Second, the base can be specified in a subscript: 1010_2 is binary, 1010_{16} is hexadecimal and 1010_{10} is decimal, without much chance for confusion. The subscripts are always in decimal.

The final convention uses the symbols percent (%) to designate binary and dollar sign ($) to designate hex. The absence of a symbol designates decimal. In this convention, our examples would be written as %1010 and $1010 for binary and hex, respectively, and 1010 for decimal.
Stewart Terrier
Alton, IL

What IS CP/M? The 128 has a sometimes mysterious mode called CP/M, about which we read very little. In CP/M mode, your computer behaves very much unlike a Commodore, and very much like an IBM or clone. CP/M is an operating system or group of programs that coordinates all the workings of your computer.

In its normal mode, your 128 uses a built-in operating system designed specifically for the 128. The 128 operating system lets you do things like format disks, display directories, load programs and change colors. Since it's built into the computer, you seldom even notice it.

CP/M is a totally different operating system that is loaded in from disk. In the early 1980's it was used by many manufacturers; Commodore, Apple and Radio Shack were notable exceptions. The common use of CP/M allowed interchange of software between computers, although many hardware incompatibilities remained.

When the IBM PC was introduced, it created a hardware standard for other computer makers to follow. Most of them switched from CP/M to MS DOS, a twin of the IBM's PC DOS. Commodore and Apple remained as exceptions, but Radio Shack switched to MS DOS.

With the CP/M disk that came with your 128, your computer can run under the CP/M operating system. When it does so, it requires totally different commands for formatting disks, displaying directories, loading programs and other similar operations.

In CP/M mode, you can run much of the CP/M applications software that was so popular before IBM standardization. Much of it is very good, and most of it is inexpensive or free.

Even if the applications software doesn't interest you, you can gain a lot by becoming familiar with CP/M. It has the look and feel of MS DOS, so if you learn how to work with CP/M, much of your skill will transfer to the IBM world.

It's a good idea to order the CP/M book and disk that are offered in the 128 System Guide. For under $20, you get a very complete manual and two useful utility disks. Without the manual, it's next to impossible to puzzle out CP/M.

There are many commercial books on CP/M as well. When looking at them, remember that your computer runs CP/M+ version 3.0, which is quite different from earlier versions.
Louis F. Sander
Pittsburgh, PA

Locating CP/M Software: There's a huge amount of CP/M software available, but it's often not easy to find. Here are two good sources: Poseidon Electronics, 103 Waverley Place, New York, NY 10011, (212) 777-9515. FOG, P.O. Box 3474, Daly City, CA 94015. Poseidon is a company, FOG is a user group.
Stewart Terrier
Alton, IL

Changing CP/M Screen Width: When loading the CP/M+ systems disk, I occasionally forget to put the 40/80-column switch in the proper position. A simple solution avoids having to reboot the system. To go into 80-column mode, just type this at the A prompt: DEVICE CONOUT:=80 COL If you wish to go the other way, use 40 COL instead.
Herbert Nelson
Chicago, IL

CP/M Disk Swapping: You can easily use files on one disk to operate on files on another, even if you have only one drive. The key is to use drive E, the so-called virtual drive.

For example, if the DIR file is on the disk in drive A, you can use it to examine another disk by entering

DIR E:[FULL] When you're prompted to insert the other disk (disk E), just insert it into your drive and press RETURN.
Tom Malcom
Mount Pleasant, IA

Exiting CP/M Mode: You don't have to reset to return to 128 mode from CP/M mode. Just press CONTROL and the ENTER key on the keypad. Before your eyes, the computer will jump back to BASIC.
James Frankland
Bellevue, NE

Joysticks for Southpaws: If you're left-handed, you know how hard it is to press the fire button on standard joysticks. By making some wiring changes, you can put the button in a better position for your hand.

Disassemble the joystick and see where the cable is connected to the printed circuit board. There will be six wires going to push-on connectors that are easily removed. Take note of their order on the board, which should be brown, white, black, blue, green and orange.

Pull off the connectors, then reinsert them in this order: blue, brown, black, green, white, orange. (Notice that the orange and black wires don't move).

Reassemble your joystick, hold it with the fire button to your right, and attack your favorite game.

Mary Lee Resnick
Butler, PA

Using Non-Commodore Joysticks: Many brands of joystick will work fine in your Commodore computer. The ones from the old Atari 2600, which nearly everybody in the world owned at one time, work perfectly. Coleco is another company whose once widely sold joysticks are compatible with your machine. You can often get used joysticks for pennies at flea markets and garage sales.

The Terrier Twins
Alton, IL

Joysticks and Keyboard Errors: If you leave your joystick plugged in when you're not running joystick software, you may get an unpleasant surprise. Depending on the port it's in, moving the joystick or pressing the button can make the computer think that you've pressed one of the keys on the keyboard.

To prevent this happening at unanticipated moments, unplug your joystick whenever it's not being used.

Stewart Terrier
Alton, IL

Plus/4 Machine Language Storage: Memory locations 1630-1771 were designed for speech software. Since the area is almost never used for that purpose, it's a good place to put short machine-language programs. It's protected and hidden from BASIC, so you don't have to manipulate any zero-page pointers to protect it, and using it doesn't steal any memory from the BASIC program area.

Be careful not to go past location 1771, since the BASIC stack begins there.

Michael Kaszubski
Baltimore, MD

Schematic Diagrams: The Programmers Reference Guides for the 64 and 128 contain schematic diagrams for their respective computers. You can use this information to narrow your search for trouble.

If you want even more thorough service data, it's available in the Computerfacts series of publications from Howard W. Sams. A Computerfacts folder includes schematics, troubleshooting tips, preliminary service checks, replacement parts cross reference lists and other similar information.

Computerfacts are available for the 64, 128, Plus/4, VIC-20, Amiga 500 and their peripherals. They cost from $20-$40, de-

Continued on page 96

ATTENTION
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The history of Activision reminds me of the month of March. The company came in like a lamb (in September 1979) and has become a true lion in the industry. Parent company Mediagenic is now financially sound; they've posted eight quarters of profitability after four years of losses. The company started as a video game developer and has beaten the odds and survived a rapidly changing home entertainment industry (and internal turmoil) that might have destroyed the average software developer. What is the secret of their success? Once upon a time . . .

The Early Days 1979 to 1983

Larry Kaplan was one of the founders of Activision Video Games Division. He can give us an inside look at how the company got off the ground.



John Jermaine: What led to the founding of Activision?

Larry Kaplan: In the late 1970's, after Atari introduced their 2600 home video game system, the video game market began building up speed. With millions of hardware units and game cartridges sold, industry sales revenues for the year topped the $330 million level. Activision was founded to take advantage of this lucrative market.

Activision was founded by four designers—Alan Miller, David Crane, Bob Whitehead and myself—and Jim Levy, president. The designers were all working at Atari Inc., on Video Computer System (VCS) 2600 games. We decided to form a company to make games for the VCS on our own, and through a mutual friend and lawyer, met Jim Levy, who was then a vice-president at GRT (a cassette tape company in Sunnyvale, California).

Over the summer of 1979, a business plan was written and submitted to a venture capital firm, Sutter Hill Ventures. The plan was approved in late September. All four designers left Atari at that time.

We were a very close-knit group in those days. We ate lunch together almost every day. David and Alan lived at the same apartment complex and played a lot of tennis together, which is how they met in the first place. The four of us spent a lot of time at local video game arcades and movie theaters.

Jermaine: Why was the focus on the Atari 2600?

Kaplan: At the time Activision was founded, a great deal of excitement was focused on the home video game market, which was beginning a rapid growth curve. Realizing that a large market for multi-function home computer software was still several years away, Activision funded its long-range software plans by entering the growing video game industry. The company was founded by a group of programmers who had worked as video game designers at Atari. So naturally, we continued developing video games for the Atari 2600. Atari had the largest market share for hardware systems at that time.

Jermaine: How was the company name selected?

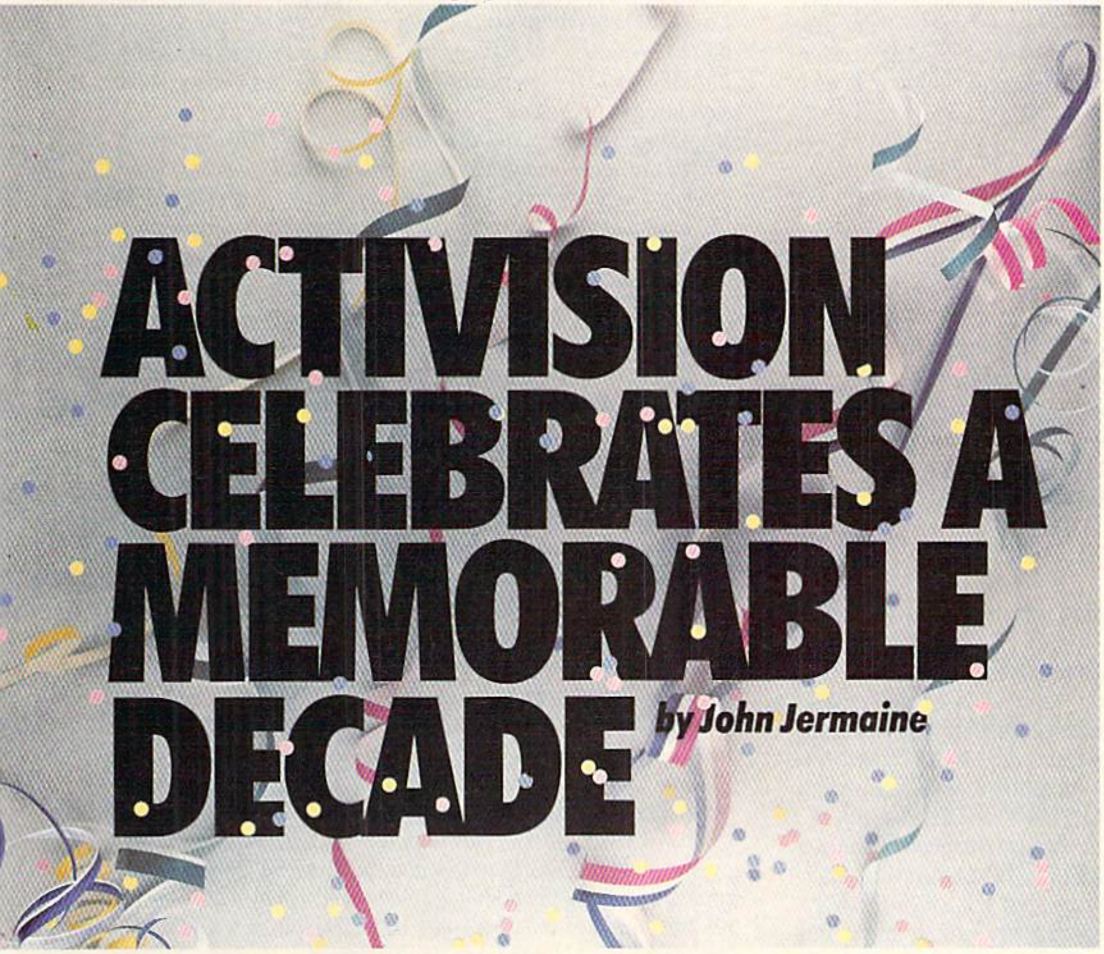
Kaplan: Prior to choosing the name *Activision*, several others were actually considered. *Computervision* sounded pretty good, but that title was already taken. The company was finally incorporated under the name *VSYNC, Inc.*, a hardware signal term from the VCS (it stands for vertical sync). The founders wanted a name that reflected various forms of art, television, computers, games, etc. Jim Levy derived the name *Activision* from a combination of *action* and *vision*.

Jermaine: Tell me about the creation of the corporate logo.

Kaplan: The first Activision logo, displayed on all the company's original video game titles and some of the early computer entertainment titles, is internally referred to as "the flying V" logo. One of the factors considered in its initial design was that it had to fit in a 32-pixel eight-line space on the bottom of all game screens. To accomplish this feat, the "T" and "V" in Activision were connected. In 1988, the flying V logo was reinstated and is now used for all computer entertainment titles published by Activision Entertainment and all video games published by Activision Video Games.

Jermaine: Was your business originally a "back bedroom" operation?

Kaplan: The first company operation—reverse engineering the VCS and building a software development system—was accomplished in David Crane's spare bedroom in his Sunnyvale apartment.



ACTIVISION CELEBRATES A MEMORABLE DECADE

by John Jermaine

By the 1980 Winter Consumer Electronics Show—the first trade show attended by Activision—the company employed eight people. Later that year, the number had grown to 15. By 1983, we were over 400 strong.

Jermaine: Tell me about the early days at Activision.

Kaplan: We all worked long hours in a very hectic environment in order to do something no one else had ever done before (make third-party cartridges for the VCS). Employees played games for fun and created them for work. The kitchen was always full of doughnuts and candy, the favorite snacks of designers. Everyone was always munching on something.

By Christmas of 1980, the company was growing out of its 1,000-square-foot office space. Since there was no space to set up a Christmas tree, David Crane programmed one and displayed it on a television set. The TV was put on a chair outside one of the offices, and employee Christmas gifts were placed beneath the chair.

During the early days, we also had our share of practical jokes. One year the vice-president of human resources became the victim of an April Fool's joke. Several employees moved his office furnishings into the men's bathroom. Then they duplicated his office with other furniture and even replaced his children's pictures with photos of someone else's kids.

Another time, some crafty individuals lined the floor of the finance controller's office with Dixie cups filled with water. On one of his birthdays, the marketing research manager (responsible for sales forecasting) received a crystal ball that looked a lot like his IBM personal computer. His office was also decorated to look like a fortune teller's den.

The first line of products for the Atari 2600 was available for the 1980 holiday season. Once these games hit the market, calls from enthusiastic consumers began pouring in. One elderly woman who had purchased *Bridge* called to ask us how to insert the game cartridge into her system. Activision's consumer relations representative asked if she had a VCS (meaning a Video Computer System). She innocently responded, "No, I have an RCA!"

Another customer called to say he was close to reaching one million points on *Laser Blast*. Incidentally, when a player reaches one million points in the game, the points displayed on the screen become exclamation marks! He later admitted that when his pregnant wife told him it was time to go to the hospital, he asked her to wait a few minutes because he was only a few points away from his one-million-point goal.

At the height of the video game craze (mid 1983), Activision was receiving more than 10,000 pieces of fan mail per week. The company was also mailing approximately 400,000 newsletters to Activision customers around the world. Close to 50 original video game titles have been produced from 1980 to the present day. Activision sold several million cartridges from the time of the boom in the early 1980's, through the less popular mid-1980's, and again during the current revival of the industry.

I recently talked to Charlotte Taylor Skeel, a former Activision employee, about her tenure at Activision. Today Charlotte is public relations manager at Accolade, Inc.

Jermaine: What do you remember about the "good old days" at Activision?

Charlotte Taylor Skeel: The company became famous for throwing huge Consumer Electronics Show parties. Among the most memorable galas were the 1982 "Rumble in the Jungle," to promote the game *Pitfall!*, and the 1983 "Decathlon party" to promote, of course, the *Decathlon* game. Bruce Jenner, who provided the celebrity endorsement for the program, made a special guest appearance.

In 1983, we also held the infamous "Barnstorming Parade," to introduce the *Barnstorming* cartridge to the media. At 6:30 a.m. three busloads of press, trade, Activision employees and friends were taken to the street in front of the Las Vegas Convention Center and presented with authentic *Barnstorming* jackets, flight scarves and old-fashioned pilots helmets. They were then greeted by a real bi-plane that taxied down Las Vegas Boulevard carrying none other than Steve Cartwright, *Barnstorming*'s designer. Afterwards, the entire group was treated to a sunrise breakfast at the nearby Desert Inn.

In 1982, Jim Levy rewarded his hard-working employees by taking the entire company (along with their spouses or "spouse equivalents") to the island of Maui for four days. It was there that the famed Beach Olympiad was held. The company was divided into teams named for tropical fruits, and events included sand-castle building, canoe racing, hula hooping, and the lei pass. The gold medal went to the Kumquat team (and I was a member of that team!).

Charlotte also recalled Activision's darkest day.

Skeel: No one will ever forget the big layoff on November 10, 1983. As people carried boxes of personal items to their cars, they were met by local news cameras. One individual commented to reporters, "There will never be another Activision." It was a very sad day because most of us thought of the company as sort of a modern-day Camelot, and here we were leaving it for the last time. No one will remember that day better than Jim Levy, the president of Activision at the time. It was also his birthday.

The Transitional Years: 1984 to 1987

As the video game market faded into oblivion, Activision started on the path to become a major force in the microcomputer software industry. It wasn't all fun and games during that period of the company's history, as Loretta Stagnitto, director of corporate communications, explains.

Jermaine: In December of 1984, Activision computer games took on a new appearance. Why did this happen?

Loretta Stagnitto: In terms of packaging, Activision computer entertainment products took on a different look to help distinguish the computer games from the video games, thus the "album style" was adopted. In addition, original artwork or photography was used for package displays instead of generating artwork that resembled the game screens from the video games.

Jermaine: Tell me more about what Activision was like during this period.

Stagnitto: When Activision began publishing computer entertainment titles, the strategy at the time (and prior to the diversification strategy that led to the acquisition of Gamestar and Infocom in 1985 and 1986, respectively) was to create truly innovative games. Most of the subsequent titles featured state-of-the-art graphics and sound, but they lacked depth of gameplay—an important element that can determine the success or failure of a product. Games like *Web Dimension, Alter Ego* and *Portal* were truly innovative, but the consumer was more interested in action-oriented, strategy games, and/or fantasy/role-playing titles. In other words, the programs weren't geared to the needs of the average user. Then the company spent a lot of money trying to convince everybody they wanted these types of programs, instead of publishing what the people really wanted. It was a very confusing time in [Activision's] history.

Jermaine: Is it true that Accolade was founded by former members of the Activision team? Why did they leave the company in the first place?

Stagnitto: In 1984 Alan Miller and Bob Whitehead, successful software designers and co-founders of Activision, thought we should be working on other forms of entertainment software. These individuals finally broke away from the company and did their own thing at their own company. Accolade was founded in December 1984, and their first product *(Hardball!)* was released in July of 1985.

Jermaine: Can you give me some information about Gamestar?

Stagnitto: Activision acquired Gamestar in January of 1985. Scott Orr stayed on to head the group, while his people created a series of popular microcomputer sports games. They include: *Star Rank Boxing I* and *II, GBA Two-on-Two Championship Basketball, Star League Baseball, GFL Championship Football, Pete Rose Pennant Fever* and many others. Scott Orr and his team of experts are gone, but Gamestar continues to turn out quality sports entertainment software.

The year 1984 saw the release of Ghostbusters, *Activision's most popular computer game to date. Two years ago, David Crane (a founder of Activision and the program's creator) and Dick Lehrberg (Activision's vice-president of product acquisition at the time) told me how the project came together. Little did they know it was destined to become the best-selling Activision product of all time.*

Jermaine: Tell me about the development of *Ghostbusters.*

Dick Lehrberg: *Ghostbusters* appealed to us for several reasons. It was a very popular movie, the subject was original, and the basic story itself provided a number of interesting elements for David Crane to work with. Columbia Pictures also contributed a great deal to the project. They were very strict when it came to approving our ideas for the program, but they worked closely with us throughout the entire project. Once the initial storyboards were completed, the rest of the approvals were fairly routine. There were no last-minute changes in our game concept.

David Crane: *Ghostbusters* was a strange project. At the time, I was in the process of creating an animated city-wide adventure. The player would be able to drive a vehicle, use a map to plot his way and add equipment to the car to give it special capabilities. This program might have evolved into a James Bond-type game if *Ghostbusters* hadn't come along.

Anyway, I had worked on this concept for several months when I took a night off to see *Ghostbusters* at a local movie theater. I really enjoyed the film. A day later, I went to work and ran into one of the people from our acquisition group. He asked me if I'd be interested in doing a *Ghostbusters* computer game.

I was truly interested in the project, but they wanted it to be completed by the end of August so the game could be released before Christmas. This was May of 1984, which gave me approximately ten weeks to develop the program. Normally I couldn't possibly program a game in that amount of time, but my new untitled creation could be adapted to fit the *Ghostbusters* storyline, so I agreed to do the project.

In the weeks that followed, I found myself attending several showings of *Ghostbusters.* Looking back, I wonder what the people thought I was doing—there I was seriously studying the movie, taking notes and drawing diagrams. Later in the project, Columbia (under strictest security) provided me a videotape of the film. They also sent a copy of the shooting script and hundreds of slides and stills from the movie.

Activision has also produced other games based on popular movies. In 1986, Aliens *(the movie) became the model for* Aliens: The Computer Game. *Steve Cartwright (the creator of programs like* Hacker, Hacker II, *and* GeeBee Air Rally) *developed this software classic, and here is how it was done.*

Jermaine: What led to the development of *Aliens?*

Steve Cartwright: Believe it or not, Activision owned the

rights to *Aliens* a year before the movie appeared in theaters. However, the in-house programmers, artists and game designers knew nothing about that arrangement. After seeing *Aliens* one afternoon, we all left the theater with the same idea: *Aliens* would be the perfect subject for a computer game. The next day I brought up the idea and found out that Activision already owned the rights to that particular property.
Jermaine: Tell me more about how the project began.
Cartwright: We planned out the entire program in 15 minutes. It was just a matter of analyzing the movie, breaking it down into key scenes, and coming up with a game concept which recreates each particular situation.

The games were designed to share a common quality. When you participate in an *Aliens* challenge, your fate is truly in your own hands. Each game is a tough little assignment where experience is the best teacher. You can play to win or experiment with different ideas, but you can't blame your failure on random events or bad luck. Those factors don't exist.
Jermaine: Did Twentieth Century Fox ask you to make many changes in the final program?
Cartwright: There were some minor changes alright, but nothing we couldn't take care of right away. Twentieth Century Fox was very concerned about the fact that our transitional scenes contained direct quotes from the shooting script. I was led to believe that Activision might have to pay for the privilege of using that material in the program. Thank goodness our legal people investigated the situation and said everything was fine.

Another problem concerned the fact that you couldn't say the aliens were killing people. They were actually capturing human beings for later use (which would be the cause of their death). We also had to use the correct terminology for everything. You couldn't talk about a small alien creature crawling around on the floor. These little devils are called "Face Huggers." In short, the owners of the license were concerned about legal technicalities, correct terminology and "good taste" at this time. We had kept in close contact with Twentieth Century Fox throughout the making of the program, so they knew all about the games and really liked the finished product.

Not many people know that the company had an east coast design center. Back in 1982, Garry and Dan Kitchen, John Van Ryzin, Paul Willson and Kevin Kalkut started the east coast design center (based in Glen Rock, New Jersey). I talked with Garry Kitchen to learn the secrets of this lost tribe of Activision.
Jermaine: How did you start out?
Garry Kitchen: We joined Activision because they needed developers with innovative ideas, and we wanted to keep busy.


Little Computer People


The Great American Cross-Country Road Race


Ghostbusters


Hacker II: The Doomsday Papers


Last Ninja 2


Predator

In 1980 my older brother Steve moved to the west coast and started his own company, Woodside Design Associates. Woodside did a lot of military contracting as well as designing games. Steve also knew a number of people at NASA. So he eventually contacted Activision and negotiated a deal to produce *Space Shuttle: A Journey Into Space. Space Shuttle* was more than just an arcade-style game because the product was designed in concert with NASA. It was an accurate simulation of a space shuttle mission, containing the orbital mathematics and physics of a real space flight. We still think it's the best space shuttle simulation ever done on any machine.

Meanwhile, back in New Jersey, we started working on Atari video game projects. *Keystone Kapers* featured a little man chasing crooks through a department store, while *Pressure Cooker* simulated a chef cooking hamburgers in a fast food restaurant. These early games were humorous and a lot of fun to play, but the video game market was losing ground. So I started playing around with the Commodore 64.

Continued on page 71

PROFITABLE VIDEO

by Gary V. Fields

If you could peek into the future you would see a world increasingly dependent upon video productions. Video is perhaps the best communication tool yet developed. Video recordings can inform, inspire, instruct, sell a product or simply entertain the viewer. A full-featured video mixes real-life images, text displays, voices, sound effects and music, animated characters and three-dimensional images to convey a message. But the exciting aspect of video productions is that one of the most powerful, professional tools used to create them today is already sitting on your desk—your Amiga.

Have you ever watched the computer-generated special effects on TV and thought how great it would be to be to create them yourself? Have you ever aspired to being an animation artist like Walt Disney? Or maybe you just wanted to add a professional flair to your home videos by adding titles and credits. If you have any video aspirations, read on.

Getting Started

Let's begin with an overview of how the Amiga enhances "video production." I use quotes because when used with the Amiga, the term *video production* covers a lot of territory. At the entry level, videos can simply mean electronically-created and stored slide shows—images are stored on disk and require a computer (not a VCR) to show.

At this level an Amiga-generated video might consist of nothing more than different screen displays (e.g., digitized pictures or graphics created on a paint program) which are then automatically loaded into the computer's memory and are flipped to the screen like an electronic slide show.

At the next level, transitional wipes (to make the changes between images interesting) and text are added between and over images—text begins to move, rotate, flash. Next come animated characters, sound effects, scrolling backgrounds. Eventually three-dimensional images could be added which would appear to spin and move inside a perfectly proportioned, computer-generated world.

At the ultimate level of production, videos include text, real-time animation and three-dimensional images mixed with real-life images captured with a video camera enhanced with music, voice-over or sound effects and stored on videotapes (VHS or Beta). At this professional level, the results are "broadcast quality"—like those you see on any network. It is fair to say, without exaggerating, that a talented individual with an Amiga, genlock, camcorder, a couple thousand dollar's worth of video equipment and some time could tape, edit and create a full-length video movie, complete with titles, credits and soundtracks. And if done with skill, a viewer would not be able to distinguish the Amiga-aided video from those created in Hollywood.

Why Video Production?

In the past 20 years, video record-

HEADLINE TYPE: *KARA FONT HEADLINES*, KARA COMPUTER GRAPHICS
DELUXE PAINT III, ELECTRONIC ARTS
PHOTOGRAPHY: CHARLES BARTHOLOMEW

ings have all but replaced the use of film for capturing and displaying motion. Most of us have become so accustomed to video programs which feature special effects and realistic animation that it is hard to believe my 15-year-old dictionary doesn't even include the word *video*. So let's define video as it relates to image production using the Amiga. For this article, *video* will refer to any recordable image which can be displayed on a monitor, and video production will include any process used to design and control screen images.

Video production is not for everyone, but if you have the urge, the talent and some cash, you couldn't have picked a better time to begin than now. Until the introduction of the Amiga, creating broadcast-quality videos required a studio filled with equipment costing hundreds of thousands of dollars. A very limited, entry-level character generator alone (required to display text on a TV) was priced in the thousands of dollars. But with the Amiga and some reasonably-priced video hardware (camcorders, recorders, genlocks, etc.), you can set up your own video production studio capable of creating income-generating, broadcast-quality, movies and clips.

Entering Video

Before you are scared off by the mention of expensive-sounding hardware add-ons, keep in mind that you can begin to experiment with video productions with nothing more than an Amiga and one animation program. In fact, if you aren't sure of your interest in video production, by all means play around with your present setup before going into hock for more hardware. Once you've seen the potential of creating videos on your own desktop, don't be surprised if you want to go further.

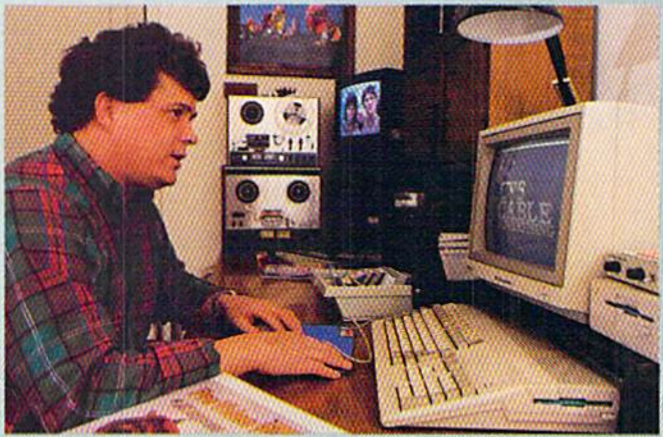
Putting Their Talents to the Test

John Inman and Bruce Chandley were both operating successful video production studios before they bought an Amiga. Both were taping, editing and selling videos for cable TV commercials, weddings, in-house training tapes, promotion, etc. John owns Captain Video in Candler, North Carolina, and Bruce is the proprietor of Focal Point Productions, Asheville, North Carolina.

John and Bruce live a few miles from each other and first met at an Amiga users group meeting. Chandley came to the meeting to learn more about the system he was using, and Inman came to investigate the computer he had heard could solve many of his video needs.

While they entered the video field with different backgrounds, their initial reason for turning to the Amiga was identical—they both needed a character generator. One of the most difficult and yet elementary chores to tackle before you can turn out professional videos is creating broadcast-quality text on the screen. Since both men owned MS-DOS compatibles, they naturally investigated the possibilities of using them as character generators. They quickly abandoned that avenue when they learned that upgrading a PC compatible to serve as even a limited character generator would cost around $3000. Inman flirted with the idea of buying an entry-level dedicated character generator, but the one that fit his budget offered only four fonts and could perform only a restricted number of wipes and dissolves. In the

> Video production is not for everyone, but if you have the urge, the talent and some cash, you couldn't have picked a better time to begin than now.



GARY V. FIELDS

Bruce Chandley, using *Deluxe Paint II* and *Kara Fonts* builds a screen for cable TV use.

end, both solved their character-generation problems with an Amiga 500, *Pro Video Plus* software and a SuperGen genlock.

During separate interviews I asked Bruce and John to suggest configurations for both a entry- and professional-level video setup. Both described nearly identical systems.

Personal Production

Here's what our experts say a user would need to begin producing videos. Remember, even with this bare-bones setup you can create professional-looking videos, complete with recorded images, animated cartoons, scrolling text, etc.

> Once you've seen the potential of creating videos on your own desktop, don't be surprised if you want to go further.

If you don't already own one you'll need to invest in a camcorder (about $1000) for taping live video; a good line consumer video deck with flying erase head ($750 plus) for recording mixed signals from the camcorder and computer, a genlock device ($150 plus) for mixing RGB and NTSC images; an Amiga 500 with at least one megabyte of RAM, monitor and external drive; and an NTSC (National Television System Committee, or in other words—a television set) monitor for displaying the edited video. If you own a Commodore 1084S monitor, you can postpone buying an NTSC monitor if you don't mind constantly switching between its RGB and NTSC signals. (Any Commodore 64-compatible monitor would also fit this description.)

Once you have all the hardware on hand, all you'll need to begin producing is some software. When asked which software packages the beginner should buy, both Bruce and John named Electronic Arts' *DeluxePaint II* as their choice for creating graphics. They suggested *TV*TEXT* from Brown Wagh as the entry-level titling program (character generator) for first-time users (primarily because of its price). To complete the beginner's setup they felt you should have at least one animation tool. Their personal choices were MicroIllusions' *Cel Animator*, Broderbund's *Fantavision* or Mindware's *PageFlipper*.



GARY V. FIELDS

John Inman, owner and operator of Captain Video uses *Pro Video Plus* to fine-tune a screen for a client.

Pro Production

As you might expect, when describing a professional setup, the tools they named were also the tools they use. To create broadcast-quality videos, John and Bruce felt the user should own two good camcorders, two video editing decks (with shuttle controls for quick scanning), an Amiga equipped with at least one megabyte and a hard drive, a good NTSC monitor and a top-line genlock device (they both use Digital Creations' SuperGen). To complete their setup both turned to Digi-View by NewTek, for a simple way to capture company logos and still photos to be added to live video.

In addition to the programs mentioned in the entry-level setup, John and Bruce recommend rounding out a professional setup with a professional titling program (they use Shereff Systems' *Pro Video Plus)*, as many good fonts as you can get your hands on, and any 3D animation program you can handle. In discussing sculpt (3D) software, both fellows agree on two points: (1) Well-sculpted and animated images add greatly to a video's viewing appeal, but (2) mastering a sculpt program is not easily done.

How it's Done

Here is an overview of how John and Bruce create complete videos. After

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TOOLS OF THE TRADE

Producing successful videos requires the right mixture of talent, energy and tools. While you can supply the talent and energy yourself, you'll have to buy the tools. Because of the volume, there is not enough room in an entire issue, much less a single article, to properly review all the exciting video software programs and hardware devices available. We'll talk about the most common software tools and follow up with a complete listing of Amiga video software and hardware. For more information on a specific product, contact the manufacturer.

For the most part, the software used to enhance or create videos fits into three categories: titling software (for displaying words and logos), animation (for creating moving images like those you see in cartoons and during TV news productions) and three-dimensional images (where realistic 3D objects or text are displayed and animated).

If you simply need a character generator for your video productions there are titling programs designed just for that purpose. If you want to create real-time animations which rival Walt Disney's best, there are several powerful programs already on the shelves ready to assist. Do you want full-color, animated 3D graphics? The Amiga and the proper sculpt tool will let you wow the competition.

So, if you have been waiting for just the right software package to get serious about desktop video, your wait is over. In short, there is no shortage of

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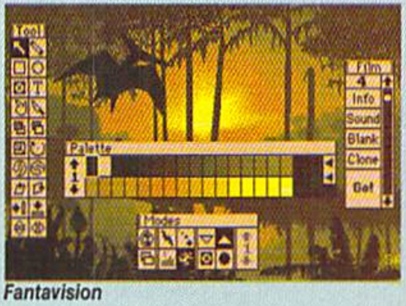
*TV*Show*



Calligrapher 2.0



The Director



Fantavision

by Robert J. Nedreski

1541 Disk Rescue

There are several conditions besides misalignment of the disk drive which will interfere with loading a disk. There are plenty of horror stories about disks that have "crashed," and the general belief is that a dust particle has lodged on the surface of the disk or that the disk has been exposed to a magnetic field which has erased or altered part of the data. While these ideas may be correct in some cases, I have yet to find them true in most cases.

If you have a valuable disk that has crashed (won't load), read on. I have found that there are two frequent causes—both rather easily remedied—when a disk will not load. Both of them result from a condition in which the disk doesn't rotate in its jacket.

There is a third condition which prevents loading a disk, also easily remedied, but in this case no disks will load.

Using the methods described below, I have reclaimed six disks that I thought were lost. One of the disks had been accidentally folded—actually putting a crease in the disk proper! Five of the disks had been recorded on both sides, although they were single-sided disks. I also salvaged several programs from a disk that had "crashed" over two years ago, which had actually accumulated a coating of dust on the portion of the disk exposed through the slot in the jacket for the read-write head. After removing this disk from its jacket, I carefully and lightly wiped off the dust with a piece of paper towel, before putting it into the "rescue" jacket.

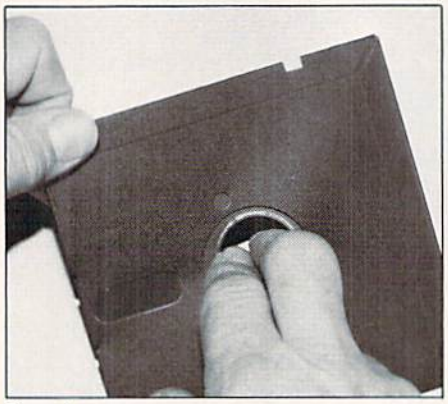


Figure 1

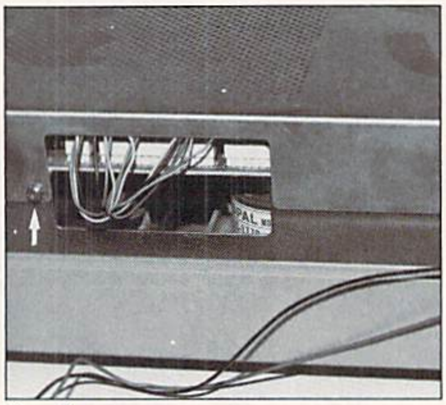


Figure 2

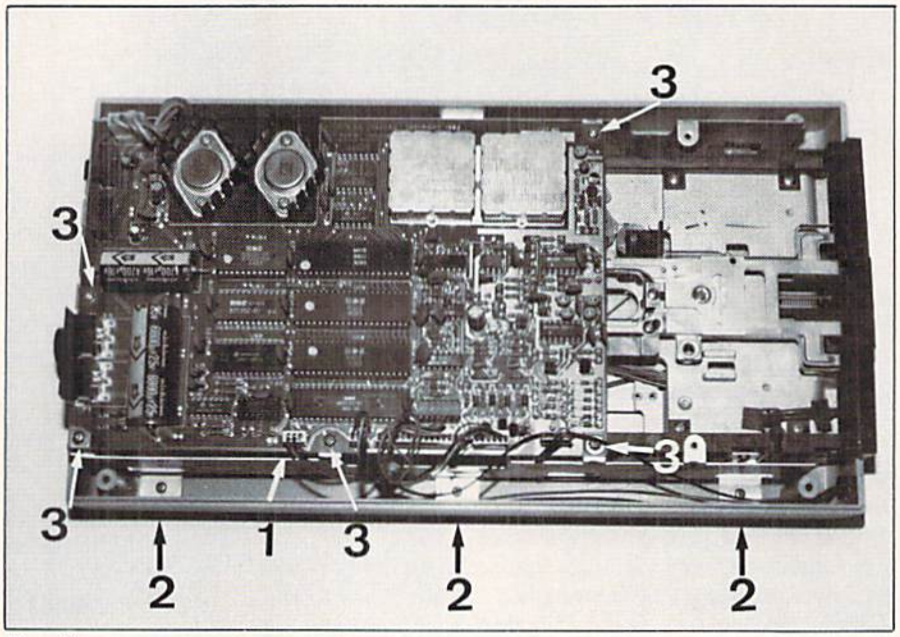


Figure 3

Disk Diagnosis

In the first case, a disk might have appeared to "crash" because the spindle drive belt is slipping on the motor pulley. This condition is probably due to frequent occurrence of the second case, described in the next paragraph. Belt slippage requires treatment only if you can't load *any* disks or only a few. If a new disk spins freely, the trouble is most probably in the other disks.

In the second case, the disk is binding in its jacket so that it doesn't rotate freely. You can sometimes detect a disk with this fault by holding the jacket in one hand and trying to slide the disk back and forth in its jacket by inserting one or two fingers in the spindle hole and pressing lightly sidewise, as shown in Figure 1. It takes a little experience to detect this condition unless the binding is really severe. I suggest trying it with both a new disk and the suspected disk for a comparison. I'm not sure what causes a disk to bind in its jacket, but I strongly suspect that it is due to fine dust collecting in the jacket liner, especially since it seems to occur only with disks that have been in use for a couple of years. A disk with this problem can be rescued at the expense of a new disk—in addition to the disk to which it will be copied.

Contrary to some published reports, the disk jackets don't have the same kind of low-friction liners that are used in tape cassettes. The disk liners seem to be a type of very porous tissue paper that is bonded to the inside of the jacket. Being highly porous, it's ideal for picking up dust—whether that dust comes from wear on the disk surface or from the environment.

The third cause of disk failure results from the read-write head in the disk drive sticking on its guide rails. The remedy is cleaning and lubrication of the rails (as described in the June 1987 issue of *Commodore Magazine.)*

Treatment

To verify that a non-rotating disk or a sticking read-write head is the cause of your trouble, you'll have to partially disassemble your disk drive. [*Warning: This will void your manufacturer's warranty.*] Handle it gently when you do, for some of the inner parts are rather delicate—although they'll stand a surprising amount of mistreatment. Still, there's no use taking unnecessary chances.

The only tools you'll need are a Number 2 Phillips screwdriver (it may look too big

for the screws in the 1541, but it will work better than a Number 1) and either a pair of needle-nose pliers or—preferably—hemostatic forceps. The pliers or forceps are almost a necessity for getting some of the screws started in some of the tight places when you're re-assembling the drive.

Start by disconnecting all cables from the 1541 to avoid any risk of electrical shock or damage to the computer. Next turn the disk drive upside-down, and unfasten the four screws located in the holes in the corners of the bottom of the case. You probably can't get the screws completely out until you turn the case right-side up again, so be careful not to lose any of them. When the case is upright, lift off the top cover.

If your drive was made by Alps you'll see a shield with small perforations in part of its top surface. If your drive was made by Newtronics the shield will have large holes in most of its top surface. In either case, remove the two screws holding the shield to the main chassis, located on the left side of the drive, as shown by the arrows in Figure 2. Now lift the shield off carefully—it's held on the right side only by two small projections on its inner surface, which snap into holes in the side of the chassis. Next remove the three-pin plug shown by arrow 1 in Figure 3. Carefully note its position before removing it—the red wire goes toward the back of the drive on mine. Also, note the way the wires from this plug are arranged before removing it, so you can replace them properly at final re-assembly.

Now replace the metal shield over the printed circuit board and fasten it with the two screws removed earlier. Next remove the six screws holding the chassis to

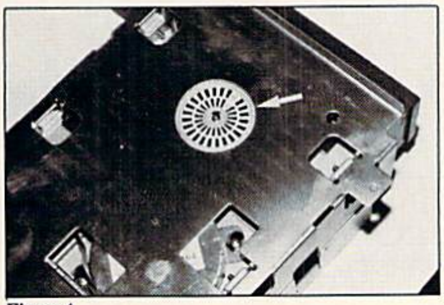


Figure 4

the bottom of the case. Three of them are visible in Figure 3, as shown by arrows 2. The other three are in similar positions on the other side. You'll probably need the forceps to get the screws out after you loosen them, because the space between the case and the chassis is very narrow.

Now carefully lift the chassis out of the lower half of the case and turn it upside down. Be careful not to lift by any of the parts on the printed circuit board, or you might damage them. The fuse holder projecting out the back or the receptacles for the serial bus are good places to lift the back end. The bottom of the chassis will

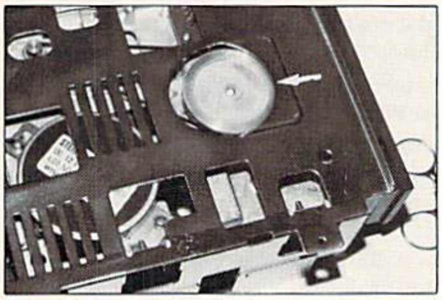


Figure 5

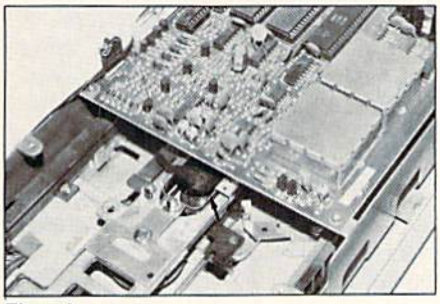


Figure 6

look like either Figure 4 (Alps) or Figure 5 (Newtronics). The wheel visible through the opening in the chassis, shown by the arrow, is the spindle flywheel.

Replace the serial bus cable from the computer and connect the power cable. Turn on the disk drive, the computer and the monitor. Type in the following short program:

```
10 PRINT"STICKY DISK CHECK"
20 PRINT"PRESS Q TO QUIT"
30 OPEN 15,8,15:OPEN 3,8,3,"#"
40 PRINT#15,"M-W"CHR$(180)
   CHR$(0)CHR$(1)CHR$(0)
50 PRINT #15,"U1:"3;0;X;0
60 GET A$:IFA$="Q"THEN CLOSE
   3:CLOSE 15:END
70 IF D=1 THEN 100
80 PRINT"IN ";:X=X+1:IF X=35
   THEN D=1
90 GOTO 50
100 PRINT"OUT ";:X=X-1:IF X=1
   THEN D=0
110 GOTO 50
```

Stand the disk drive chassis on its right side, so you can observe both the top and bottom. Insert a new blank disk and type RUN and press RETURN. If the flywheel

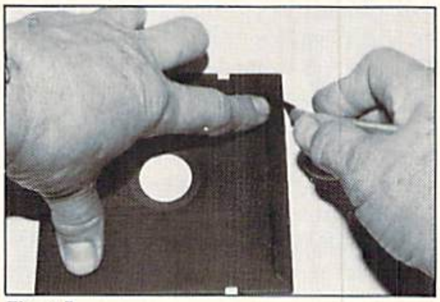


Figure 7

rotates continually until you press "Q," there's no trouble with a slipping belt. If it doesn't rotate, or rotates jerkily, a possible remedy is given later in this article under the sub-head "Slipping Belt." If the flywheel rotates, but the read-write head—the black object indicated by the arrow in Figure 6—doesn't move back and forth as the test progresses, your trouble is a sticky head carriage, and the rails need cleaning and lubrication. The remedy for this was given in the June 1987 issue of *Commodore Magazine*. If your drive is by Newtronics, you'll probably have to remove the shield to see the read-write head easily.

If the flywheel rotates freely and the read-write head moves back and forth, stop the drive by pressing "Q," remove the test disk and insert the disk that won't load. Be sure to insert it with the label toward what is normally the top of the drive. Now type RUN and press RETURN again. If the flywheel doesn't rotate freely,

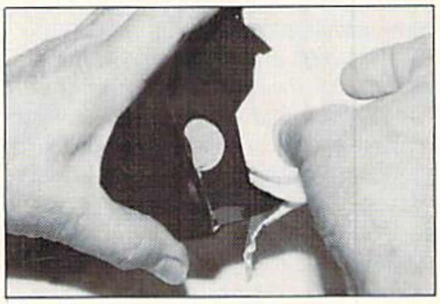


Figure 8

the belt is slipping because of a sticky disk. Press "Q" to stop the drive and remove the disk.

Rescuing the Disk

For this you'll need a sharp knife and a couple of paper towels or facial tissues. Check them to be sure that they are lint-free. Take a new disk and holding the jacket in one hand, press the disk toward the edge of the jacket which has the slot for the read-write head, so that is will be

as far as possible from the edge where you will open the jacket. Hold the disk jacket on a hard surface with one hand and with the other, cut through the jacket near the edge with the label—the edge opposite the slot for the read-write head, as shown in Figure 7. Don't try to cut through all three layers of the jacket at once—it's too easy to make the knife slip and either cut yourself, or damage the disk or the jacket. It's best just to score the jacket with the knife on the first cut and make repeated cuts, each a little deeper, using the score as a guide. Make the cut about $\frac{1}{16}$ of an inch from the edge of the jacket. Whatever you do, *don't* use a steel straightedge to guide the knife—it might be magnetized, in which case it could ruin your disk irretrievably.

When the jacket is cut open, spread the cut edges apart, and holding the jacket in one hand, remove the disk from the jacket, using a tissue or paper towel to hold the disk, as shown in Figure 8. Place the disk on another tissue and fold the tissue over it to protect it until you put it back in the jacket, and put it in a safe place.

CAUTION! Do not handle any disks with metal tweezers or forceps, unless you have tested the tool with a magnet to ensure that it is non-magnetic. Otherwise, you could ruin a program on the disk.

Open the jacket of the sticking disk in the same manner, and transfer the disk to the new jacket. Be certain to have a write-protect tab over the notch in the new jacket, so there's no chance of accidentally erasing part of the old disk before you have made a successful copy. Place it in the disk drive and run the test program again. If the disk rotates freely, go ahead and copy it to a new disk using one of the copy programs which has been published in recent years, unless it's a copy-protected disk. If it's a commercial, copy-protected disk, you'll have to use one of the programs intended for copying such disks.

The new jacket can be used to rescue quite a number of old disks. I really don't know how many, but as I stated at the beginning, I have copied six disks this way, using the same jacket. It might be a good idea to put a special label, such as "First Aid Jacket" on the new jacket and save it in your disk file for future use.

Some of the programs on the original disk may not copy successfully, but most of them should. When your copy is complete, remove the disk from the drive. At this point, you may want to experiment to see if you can rehabilitate the old jacket. To do this, get a two-inch or three-inch sterile gauze pad—it doesn't need to be sterile, but that's the way they come. Unfold the gauze pad until it's about five inches wide—or a little less—and somewhat longer. Take a diskette sleeve and fold the gauze over one of the short edges, fastening it in place with a couple of pieces of "magic" tape. If the gauze is *narrower* than the sleeve, keep the edge of the gauze aligned with the bottom of the sleeve.

Insert the sleeve with the attached gauze into the empty old jacket, keeping it as close as possible to one edge of the jacket. Press the sleeve into the jacket as far as it will go, and work it in and out a few times. Now withdraw the sleeve, turn it over and re-insert it, keeping it as close as possible to the other edge of the jacket, repeating the steps above. The idea is to expand the jacket slightly and to brush out any dust that may have collected in the liner. Withdraw the sleeve again and replace the old disk in the expanded jacket. Put it in your disk drive and try to load the directory or a program. You *may* be pleasantly surprised. If not, at least you have a copy on a new disk.

CAUTION! Don't seal the cut edge of the old jacket with any kind of tape after you re-insert the disk. Unless you are very careful, the tape will pull the edges of the jacket together causing the disk to bind again.

Slipping Belt

If you find in the test described earlier, that the flywheel doesn't rotate with a new disk in the drive, the disassembly must be carried a few steps further. You will need a small amount of some type of solvent to clean the motor pulley, the flywheel and the belt. I used a solder-flux removal spray I had available, because it didn't seem to injure the belt surface.

You will need some cotton swabs and a pencil eraser. If you don't have the solvent suggested above—you can buy it at any electronics parts store—I suggest isopropyl (rubbing) alcohol. Lighter fluid might work, but if the belt contains any kind of rubber, the lighter fluid could damage it.

First, the printed circuit board must be removed to get clearance for removing the motor assembly. Set the chassis on the bench in its normal position and remove the metal shield mentioned earlier. Note carefully how the plugs on the left edge of the printed circuit board are positioned, and remove them. Don't touch the pins of any of the integrated circuit packages on the board, for some of them are MOS circuits and can be damaged by a static discharge from your fingers, unless you are using a properly grounded wrist strap. The ones that are susceptible are usually stamped with the letters MOS, although some manufacturers use stylized letters that are hard to recognize as such! You can see what they look like in Figure 3, and also on your own disk drive.

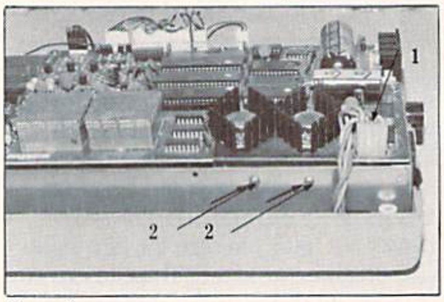


Figure 9

Turn the disk drive around so that the right side is facing you, as shown in Figure 9. First, remove the power plug shown by arrow 1. Note that the wires run *behind* the plug; be sure to replace the plug in the same position when you reconnect it later. Next remove the two screws holding the heat sinks in place, indicated by the arrows 2. Now remove the five screws holding the printed circuit board to the chassis. One of these screws is located at the right-front corner of the board, one at the left-front corner, one at the center of the left side of the board, one at the left-rear corner and one at the center of the back edge. They are shown by the arrows 3 in Figure 3. Lift off the printed circuit board, handling it by its edges, and put it in a safe place. Don't lose the screws—they have metric threads and replacements are difficult to find in the U.S.

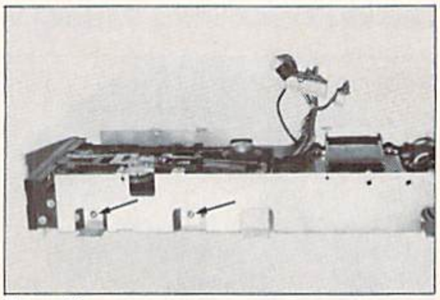
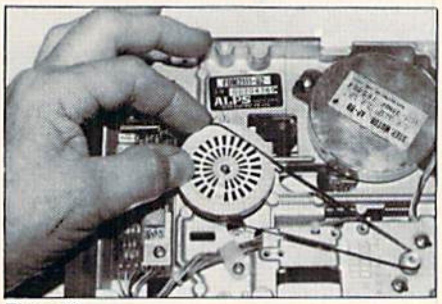

Figure 10

Figure 10 shows the right side of the Alps chassis with the printed circuit board removed. The Newtronics chassis is similar. To remove the motor assembly, four screws must be removed. Two of them are shown by the arrows in Figure 10, and the other two are in the corresponding posi-

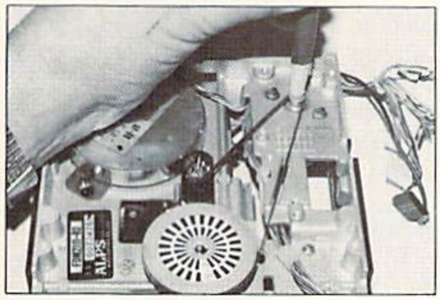
tions on the opposite side. Now lift the motor assembly out of the chassis. You may have to do a little maneuvering, because there are some "ears" on the chassis which prevent direct withdrawal.

Once the motor assembly is free, place it on the bench upside-down. It will look something like Figure 11. Again, this is the Alps, but the Newtronics is similar. Turn the flywheel while pressing upward on the belt with a finger to remove the belt. Note that the belt has one smooth side and one side with a slight pebbled texture. The smooth side goes inward.

Moisten one of the cotton swabs with solvent, lay part of the belt on the bench with the smooth side up, and press the solvent-moistened swab against the smooth


Figure 11

side, while pulling the belt between the bench and the swab until you have cleaned the entire inner surface of the belt. Lay the belt aside for the moment and with another solvent-moistened swab, clean the rim of the flywheel. Finally, take a third solvent-moistened cotton swab and clean the motor pulley by pressing the swab between the flanges, where the belt rides and rotating the motor pulley by pressing the eraser against the end of the pulley and twisting the eraser between


Figure 12

your fingers as shown in Figure 12. (Don't have the belt in place as the picture shows!)

Let the solvent dry thoroughly, then replace the belt by reversing the procedure shown in Figure 11. With a disk in place in the motor assembly, check that the belt is replaced properly and that the flywheel rotates by twisting the motor pulley with the eraser, as in Figure 12. Replace the motor assembly in the chassis and fasten it in place with the four screws. Replace the printed circuit board and fasten it with the screws removed earlier. **NOTE:** It's best to *start* all of the screws first holding the printed circuit board and the heat sink before fully tightening any of them. Reconnect the plugs from the motor assembly to the printed circuit board.

Connect the serial bus and power cables temporarily and check drive operation using the program given in the beginning of this article before replacing the drive in its case. If everything is all right, remove the cables, replace the chassis in the lower half of the case and fasten it with the six screws removed earlier. Connect the three-pin plug from the green indicator light in the lower half of the case to the PC board, and install the metal shield over the printed circuit board and replace the two screws holding it. Finally, place the top cover on the drive, invert it and replace the four screws holding the top cover in place. ■

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by Mark Jordan

ML Programming Via the Monitor



ART BAXTER

In the next few months, we'll be exploring the technical, the whimsical and a few things in between. If there's a topic you'd like to see covered, write to Mark in care of *Commodore Magazine*, 1200 Wilson Drive, West Chester, PA 19380.

In the world of the 128, there are three kinds of people: program users, BASIC programmers and machine-language programmers. This is not a fuedal society with users playing the serfs, BASIC programmers the knights, and ML (machine-language) programmers the lords. That's the theory, anyway. Unfortunately, in the real world a pecking order exists. ML folks spurn the BASICs, who in turn snub the users. The poor user stands alone. Ugly, ugly, ugly.

If you are one of the many who look at a machine-language program listing and start to panic, I've got some good news for you. With one simple article you are going to acquire enough knowledge about machine-language programming to: (1) not feel inferior when a bunch of ML'ers are strutting around, and (2) become a budding ML programmer. You might not be ready to rule the roost, but you'll get a good enough peek inside of machine language to know what it's all about.

I actually wrote an article on this topic about three years ago for the Commodore 64 but I never submitted it for publication. The reason was that the Commodore 64 doesn't have a built-in machine-language programming aid called a monitor. That meant that most of my potential audience would never be able to try out what I told them. But with the Commodore 128, this problem does not exist: the 128 has a built-in, quite powerful ML monitor which you can use.

The term *monitor* is a bit confusing because that's what we also call the screen we hook our computers up to. A machine-language monitor is simply a program that lets you program in machine language in a convenient way. It isn't the only way to program in machine language and it isn't the best (an assembler is the best), but it's a great tool for typing in and/or debugging short ML programs. It's perfect for what we want here.

Entering the Monitor

With the 128 the monitor is always intact—all you need to do to get it up and running is to type MONITOR and press RETURN. When you do that you see the following on your screen:

```
  PC     SR  AC  XR  YR  SP
XXXXX    XX  XX  XX  XX  XX
```

It looks very cryptic until you've done a little machine-language messing around. For this article you'll need to know about only one of the above mnemonics and that's AC. However, I'll briefly identify what each of these two-letter abbreviations stands for and explain the concept to provide an overview of ML programming. A word of advice: if you temporarily seem to be lost in the woods, keep walking. We will never get more than a rod or two deep and just having stumbled through these sections of the forest will prove beneficial.

The *PC* stands for "Program Counter." ML programs don't go by line numbers, they go by addresses. What this means is that the real computer within your computer—the CPU (central processing unit)—does its work by starting at the address pointed at by the PC; after it has dealt with the instruction found at that address, it looks at the PC for the next address to deal with and so on to the end of the program. And in case you're wondering, there are exactly 65535 addresses your CPU can deal with.

One last word about the PC: it will always give you a five-digit hexadecimal number. The first digit has to do with the bank, or configuration, of the system. For simplicity's sake, this number will always be 0 for the work we're going to do. Mentally strip it off and look at the last four digits to see the address we're actually on.

SR stands for "Status Register." A register is nothing more than a memory cell, a byte, somewhere in RAM that holds a number between 0 and 255. This particular register always tells the CPU the status of certain things, like whether or not the last thing that happened resulted in a negative number or a zero.

The *AC, XR* and *YR* are the three most crucial concepts you need to learn to understand when doing ML programming. *AC* means Accumulator, often simply called *A*. This is the main register you will deal with. Many instructions you put in your programs will cause the CPU to look at the Accumulator's contents (which like all registers is between 0 and 255) and then do different things. More on that later.

XR and *YR* are the X and Y registers. These two work together with the Accumulator most of the time. The chief difference between them and the Accumulator is that they can be used as indexes. For example, you can load the Accumulator with whatever is in memory cell 2500 by typing LDA 2500 (which means "Load the Accumulator with whatever's in address 2500"). If you do it this way: LDA 2500,X you will load the Accumulator with whatever is in memory cell (2500 + X). If X happens to be set at 5, then your LDA 2500,X will give you the contents of memory cell 2505.

This simple article of ours won't require that you do any indexing . . . in fact, we won't mess with the X and Y registers at all, or the Status register or the Stack Pointer (SP). The Stack Pointer is the last of the symbols we see when we first enter the monitor. You don't need to worry about it at all for now and seldom for most machine-language projects (though the CPU will use it a lot).

That's what those six abbreviations stand for. The numbers you see below them are nothing more than their contents when you first enter the monitor. And to be quite honest, we don't care what they say for now.

Hack Time

Let's write a program. There is no better way to learn ML than by doing. I promise to go slowly, to hold your hand, and to avoid quicksand. Start by entering the monitor. While you don't actually have to get up from your easy chair right now and type this stuff in, it's not a bad idea.

We're going to write a machine-language interrupt program. Since the computer interrupts itself with annoying regularity (60 times a second), we'll hop into each interruption and tell the computer to move a sprite for us. Doing things via the interrupt makes magical things happen.

We begin by typing this: A 00C00 SEI. (You'll need to hit RETURN after every line.) Let me explain what we just did. The *A* means "assemble." Since the CPU doesn't know what SEI means or anything else we're going to type in, we need the monitor to interpret, or assemble, our commands.

The 0C00 (strip off the first 0) is the memory address we are going to place our program. It happens to be a free area of memory that is very handy for short routines. If hexadecimal numbers aren't second nature to you, don't worry about it. 0C00 equals 3072 in decimal numbering. Our monitor is smart enough to work with decimal numbers if we choose: we could type A +3072 SEI and we'd get the same result (the plus sign tells the monitor it's a decimal value). But for our program we'll stick with hex. It's actually more convenient.

SEI is an instruction that the monitor understands much the same as PRINT is a comand the BASIC interpreter understands. It stands for "Set Interrupt Disable Bit." Which, in layman's terms means, "Stop all CPU interruptions for a second so we can slip our routine into place."

After we press RETURN, the computer will respond by assembling our line and printing out a coded version of it: A 00C00 78 SEI The only new element here over what we typed is the 78 in the middle. This is the numerical value of the SEI command. This our CPU understands. You'll also note that an A 00C01 appears on the screen below our first line. It's like automatic numbering allowing us to skip typing the address each time, a nice convenience.

Our second instruction will be a famous one: LDA, which, as already mentioned, means Load the Accumulator. Here's how we'll use it:

A 00C01 LDA #$0D

We are placing the hexadecimal number $0D into the Accumulator. The pound sign (#) means we want the number $0D, not what's in the address $0D, and the dollar sign ($) means its hexadecimal. $0D equals 13 in decimal. Trust me. With our $0D in the Accumulator, we're ready to store it somewhere. Type this:

A 00C03 STA $314

STA means to store the value in the Accumulator in whatever address follows. Why did we store it in $314? Because that's an important address for the interrupt. Actually, it's half of an important address. We need to put the other half in memory address $315. By the way, we can drop the dollar sign; the monitor will supply it for us):

A 00C06 LDA #$0C
A 00C08 STA 315

We reload A with a new value ($0C) then store it in the next address following 314. You'll see why we stored an 0C and an 0D in consequetive bytes in just a minute. We're done interfering with the interruption process so we need to tell the CPU that. Here's how:

A 00C0B CLI
A 00C0C RTS

The first command means "clear the interrupt flag and get back to normal interrupting." The second command, RTS, tells our CPU to Return from the Subroutine. What subroutine? The one you just wrote. Let's float up over the trees for a moment and take a look at what we've created from the bird's-eye view.

We created a short ML program. All it does is place two new values in addresses 314 and 315. But these two bytes, side by side, are a pointer that the CPU looks at 60 times a second to see where to go. Normally, these two bytes hold the address FA65 because that's where the computer's interrupt program resides. But we have changed it to point to our own interrupt routine which will begin at address 0C0D.

When we first run this program—by typing SYS DEC("0C00")—the PC will be loaded with the address 0C00 and the CPU will look there to see what to do. It will see our SEI instruction so it will do that. Then it will look at the PC again to see where to go next, and since we didn't tell it to jump anywhere else, the PC will point to the address just after the SEI instruction. So the CPU will do what's instructed there: load A with #0D. Then it drops to the next instruction, stores A, and so on. And that's how machine language works.

The only trouble is, if we would run the program right now, the machine would lock up because we haven't put anything at 0C0D for it to do. So we need to write another ML program. Wow, two programs in one article—we're making headway.

The Actual Interrupt Routine

Back to typing.

A 00C0D LDA DC00

This line loads A with another memory cell's contents. Address DC00 just so happens to be the byte that always knows which direction the joystick in port 2 is being pressed. So the Accumulator will now contain that information. We're going to see if the joystick is being pressed up or down. First we'll check for up.

A 00C10 CMP #$7E

A new instruction appears, CMP. This causes the CPU to compare whatever value is in A with whatever value follows our CMP command, in this case $7E. Why $7E? Because if the joystick is being pressed up, that's what number will be in DC00. But why, you press. Don't ask. Remember, this is an introductory piece. You'll just have to trust me that I know what I'm talking about. And trust me, you can trust me.

OK, the CPU compares whatever was in the Accumulator (which is whatever was in the joystick register) to $7E and let's say that, sure enough, there's a $7E in the Accumulator because that's what direction the joystick was being pressed when this command was encountered. We now need to tell the CPU what to do.

A 00C12 BNE 0C17

Here we tell the CPU to Branch to address 0C17 if the comparison we just made was not equal. Almost always, right after a CMP instruction, a branching instruction will occur. The CPU sees this, checks the Status Register to see if the comparison we just made resulted in a true or false condition (trust me), then branches (or doesn't) to the address that follows.

If the joystick was indeed pressed up then our comparison results in Yes, the two numbers are equal and thus the CPU will ignore branching to 0C17 and simply fall through to the next instruction.

A 00C14 DEC 11D7

This will move sprite #1 up one pixel. DEC means Decrement whatever address follows. 11D7 just so happens to be the address that positions sprite 1 vertically on the screen. By decrementing whatever value happens to be in 11D7, we effectively move the sprite up one slot.

In other words, if the sprite was at position 100 vertically, DEC will make it move to position 99. What happens if the sprite's at position 0 and we decrement it?

It rolls around to the highest number a byte can hold, 255. And thus our sprite goes to the bottom of the screen to start scrolling upwards another time.

Now what do we do after moving the sprite up a spot? This:

A 00C17 CMP #$7D
A 00C19 BNE 0C1E

If you glance up you'll notice that this address, 0C17 is where we would've come in the first place if the joystick hadn't been pointing upwards. After decrementing our sprite's position, the Accumulator still holds the value of the joystick. Since it was pointing up that value is $7E. So when we drop down to line 0C17 we will compare our $7E with $7D and those just ain't the same.

Therefore, the following BNE instruction will be followed, and the program will branch to line 0C1E. OC1E is the end of our routine but we're not quite ready to type it in yet. Why not? Because sometimes when we're going through this loop the joystick will be pointing down and thus a $7D will be in address DC00 and consequently in our Accumulator as well. And in that case we won't branch to 0C1E, we will fall through to the next line.

A 00C1B INC 11D7

Look familiar? It should. It's doing just the opposite of line 0C14. Instead of decreasing our sprite's vertical position, we are increasing (INC means increment) by one. So if the joystick is pushed down, the sprite will go with it.

A 00C1E JMP FA65

The last line of our program is a jump to the address where the real interrupt routine begins. By jumping there we leave the rest of all this interrupt business to the machine.

Before continuing, let's save our creation. Get on a blank line and type: S "OUR CREATION",8,0C00,0CFF [RETURN]. Be sure you have a disk in the drive. If you ever want to re-load it, you can do it from BASIC by typing BLOAD "OUR CREATION".

Let's review what we've done. We installed an interrupt routine beginning at 0C0D. After our routine has been executed, the computer can go merrily off on its own interrupt routine. While in our routine, however, it has the task of checking the joystick register and comparing it to an up move and a down move. If either occurs then our routine will move sprite 1 accordingly.

We need to try it out. You can exit the monitor by typing X on a blank line and pressing RETURN. Once back in BASIC you'll need to first get a sprite showing on the screen. Type this in direct mode:

SPRITE 1,1,2:MOVSPR 1,100,100

If nothing shows up then you'll need to define a sprite. Use the SPRDEF command to design a sprite shape for sprite 1. Then exit and repeat the above sprite commands.

Now we need to install our interrupt. Type SYS DEC ("0C00"). When you press RETURN . . . nothing happens. Nothing yet, that is. Plug a joystick into port 2 and press it up. Ya-ha, our sprite moves smoothly upward. Press down. Ya-hey, down she goes.

If you've stayed with me this long, you are absolutely no longer an ML Cheekako (greenhorn). We didn't just create an ML program, but a sophisticated interrupt routine. Not bad at all. Of course, there are dozens of ML instructions we didn't look at, and lots of questions in your head that are unanswered. But once you've done this much, you have passed through the initiation rites. Some of you will be inspired to dive into ML while others will be happy just to kind of know what it's all about. And all of you will no longer cower in the presence of the ML Lords. ■

Continued from page 14

and top-spin. Once this shot is selected by the player who is serving, a green target area rectangle—with a center line—is visible that lets players know how difficult their shot will be. If the rectangle is long, the shot is easy, and it will be easy to return the shot. The "degree of difficulty" is also displayed numerically.

In order to correctly serve the ball, the player must watch a thermometer-like bar as it moves toward the green rectangle. If the server hits the fire button when the bar is within the rectangle, the shot will be successful to a degree. If the moving bar stops exactly on the green-rectangle center line, the shot will be perfect. Shots within the green rectangle area, but not exactly on the center line are successful, but not as accurate. Announcement of shot accuracy is indicated in the control box.

When the ball is approaching—as in real tennis—you must simultaneously aim your shot, pick the type of shot you want to make, and time the ball to hit it exactly. Aiming the shot is accomplished by moving a yellow dot in your opponent's area on a map of the court. This map appears in the control box immediately after the ball has been hit by your opponent. Your choice of shots includes volley, smash, lob, forehand or backhand shots. And timing the hit is made with the thermometer-like bar and green rectangle target.

Strobe View

Reality is simulated dramatically with the software's trademarked "Strobe-O-Stroke" view of each hit of the ball. In the control box, after all the decisions are made regarding positioning, aiming and hitting, a graphic appears. This graphic shows the relative arm-and-body position of the player—different for serves, forehands, smashes, lobs and the like.

The graphic also shows when the ball is very near the player. Since all decisions have been made, the graphic shows the completion of the shot, as if it were photographed in slow motion. In fact, the graphic is even better than a slow-motion picture. Players see the tennis racquet moving from the proper starting position, to hitting the ball, to the follow through.

The action of this graphic is smooth—to the point of almost appearing like a movie of the actual volley itself. The extension of the racquet for a correct serve is correct and lifelike. Even the slight turning of the racquet during the hit seems impeccably correct.

Training Value

As "training" software, *Serve & Volley* is great. Getting new tennis buffs to think about where to place the ball, how fast to hit the ball, whether to use top-spin, slicing or a flat shot accounts for probably 90% of the game. Players easily become engrossed in a thinking process that mirrors play on a real tennis court. There is almost no mental difference between a real tennis game and the 64 version.

Another reason for *Serve & Volley*'s tremendous training value is that it offers a visualization of the actual stroke needed to hit the ball. Since the graphic provides the start of the hit, the actual hit and the follow through, the player can correctly "watch himself" making the hit. Most athletic coaches realize the value of an athlete "visualizing" a successful move. This software helps the player to do just that.

The combination of the close-up Strobe-O-Stroke™ view, the need to make many quick decisions, and the consistent back-and-forth action of the game makes *Serve & Volley* a package with which one can fall in "love." ■

by Matthew Leeds

Still Video

It looks vaguely like a standard film camera, all the familiar parts are there: lens, viewfinder, flash, shutter release; but when you open the back to put in a film cartridge you find a two-inch micro-floppy already in place. This odd beast is a still video camera.

They come in all shapes and sizes; the earliest looked like shrunken camcorders, later models took on the more familiar appearance of 35mm SLR's, and the newest look more like overgrown 110 cameras. The one thing that they all have in common is that two-inch floppy and the still video images stored on it.

Still video cameras record single video images on a magnetic floppy disk. Once stored on a disk, images may be played back for viewing, printed out on a video still printer, transmitted over telephone lines via a still video transmitter, and copied from disk to disk with little or no loss of fidelity.

Still video recorders can be included in a camera (still video cameras, think of a camcorder) or can be stand-alone units similar to VCR's. The video input source can be any standard video signal, with some recorders accepting analog or digital RGB as well.

All still video devices adhere to a standard format for recording and playback. The storage medium is a two-inch hard shell floppy disk, similar to the 3.5-inch floppy used in the Amiga. The disk spins at a constant velocity of 3600 rpm and is divided into 52 tracks. Two of these tracks are reserved for directory information (sounds very similar to an Amiga's hard disk set-up). Unlike Amiga floppy or hard drives, the still video drives contain only a single head, but that head can read two adjacent tracks simultaneously.

The reason for this unusual design relates to the image recording capability of the still video format. Images can be recorded in two modes or quality levels: field or frame. You may know that NTSC video consists of two sets of interlaced images composed of the odd and even lines on your TV or monitor. These two interlaced images are displayed sequentially to increase apparent resolution and reduce flicker. Each odd or even half of the complete image is known as a field; when displayed together the two fields create a full frame.



Mavica® Still Video Camera, Playback Adaptor (MAP-T1), Optional Remote Control (RM-C1), Mavipak® Disk

As you may have deduced, still video images can be stored as either single fields, allowing a total of 50 images to be stored on a single two-inch floppy, or as full frames, resulting in a maximum of 25 images. Playback of a full-frame image requires that the floppy drive head read the two adjacent field tracks at the same time.

It's important to note that the video image is stored on the disk as an analog signal, not a digital signal. Still video equipment cannot substitute for a digitizer or frame grabber, although it can be used to provide flawless still video for digitizers that require a still image to function correctly. The two-inch floppy disks used in still video can store around 800K of data as digital information, not nearly sufficient to handle the files that would be created by converting many analog video images to a digital format. By keeping the video signal analog, the access times for any given image are kept very low, as are the recording times. Some still video cameras can record four to nine images per second.

Just as an aside, the storage capacity for digital information of the two-inch still video floppy would support the same amount of information stored on Amiga floppy disks. Just imagine a laptop Amiga using two-inch floppy disks. As I said, just a thought.



Sony® Still Video Recorder (MVR-A770)

What's Available

The still video format has been standardized, and by 1986, 43 companies had agreed to support a single format for storage on still video floppy disks. Included in that standard was support for audio tracks. Each track can store just under ten seconds of audio information. A few cameras include microphones so that you can record comments about each image, and most still video recorders have audio input and output jacks.

Now that we understand the basic format of still video images and their recording medium we can look at some of the hardware available for use in still video systems. The beginning of any still video system is a camera. Still video cameras owe much of their design to Single Lens Reflex (SLR) 35mm still cameras. They usually offer auto-focus and auto-flash, with the flash built in on some units, and a hotshoe-mounted extra on others.

The lens may be a fixed focal length in some of the low-priced consumer models, but is often a zoom lens in the more expensive systems. Most offer an LCD readout panel with information on lens and shutter settings, numbers of tracks used or unused, white balance mode (remember, this is video), and other useful data. Oddly enough, many cameras do not provide any means of playing back recorded images. The newer consumer models do provide this capability.

Stand-alone players and player/recorders offer a wide range of features. Some, such as Sony's portable MVR-A770,

can be battery powered, and have a jog-shuttle search dial for quickly finding a specific image. Some players can be programmed to play back images in a specific order, while others can be computer controlled (more on this later). On-screen display of the date of recording, track number, image ID number, and other track information is provided by high-end players. A graphical display of the tracks used and whether they contain field, frame or audio information is also available. The one thing I have not yet seen is a dual drive recorder. If you want to dub from one disk to another you will need two units—at minimum a camera and a recorder or player.

In addition to players, several companies market still video printers. These are specialized color printers that use either high-density ink jet or thermal transfer technology to convert a video image into color hardcopy (see "Color Hardcopy Options," May 1989 for more information). There is a great range in both quality of output and price in video printers. Some printers are available for under $2000 while others can run in excess of $10,000. The cost per print can also vary quite a bit. In general it starts a little below a dollar per print.

Since several manufacturers are targeting the consumer market with still video cameras, you can expect that by year's end still video printers will start showing up in one-hour photo labs and drug stores, and I would not be surprised to see coin- or credit card-operated units in shopping malls. A typical unit would include a slot for payment, a second slot for you to insert your still video disk, a color monitor and controls for selecting the image to print. Color correction controls may also be provided as well as cropping and zooming capabilities.

Another peripheral for still video systems is the transceiver—a device for sending and receiving still video images over telephone lines. Each manufacturer of transceivers has developed its own special way of encoding still video images for transmission, and the standardization that exists for image storage on disk does not extend to transceivers. If you want to receive a still video image from someone using a Canon transceiver, you had better have a Canon transceiver on your end as well. This lack of standardization has so far retarded the development of service bureaus that accept telephone line-delivered images for printing. There has been some discussion of developing a standard for transceiver protocols, but since this would obsolete existing units, agreement has been slow in coming.

What's to Come

A prime example of the advantages offered by still video over conventional video and still photography was recently demonstrated during the inauguration of President Bush. An Associated Press photographer used a still video camera to capture an image of the president taking the oath of office. The image was transmitted over the wire service less than a minute after the image was taken. This kind of immediacy will become more prevalent as the technology moves towards greater standardization.

Imagine in the not-too-distant future a video-phone with a two-inch floppy slot in the side. You call up your parents and send them a still video image of their grandchild, or you call a client and send an image of a color ad or architectural rendering for their approval. It appears on the color monitor in the video-phone and can be stored on a still video floppy at the other end. This fantasy may become reality in the very near future.

Looking a little further down the road, as still video color printers show up in retail establishments it seems that this would provide an economical avenue for color hardcopy of Amiga-generated images. Not everyone can afford a six- or seven-figure color printer, and the downward pressure that retail availability exerts on product prices will be a welcome experience for Amiga enthusiasts looking for an alternative means for obtaining color hardcopy.

Current Applications

There are applications for still video technology right now as well as in the future for Amiga owners. Still video offers—as its name implies—a rock solid still video signal. Most of the video digitizers on the Amiga require a still video signal to capture color images. Have you ever tried to get your cat to sit still under a video camera while you spin a color wheel to digitize its image? Capturing images to be digitized on a still video disk first means you don't have to drag your Amiga and digitizing set-up around with you. You don't have to take film-based pictures, wait for them to be developed and printed, and then stick them under a camera and color wheel.

Still video also offers an excellent way of showing off computer-generated images. Instead of dragging your Amiga with you, or convincing your friends to come over to see your latest ray-traced image (four day's worth of rendering time—they had better come look!) you could simply connect your Amiga to your still video recorder or camera, record the image, then bring the recorder or camera (providing it has playback capability) to your friend's home and display it on their TV. The Sony portable recorder/player is just slightly larger than a notebook and weights under six pounds.

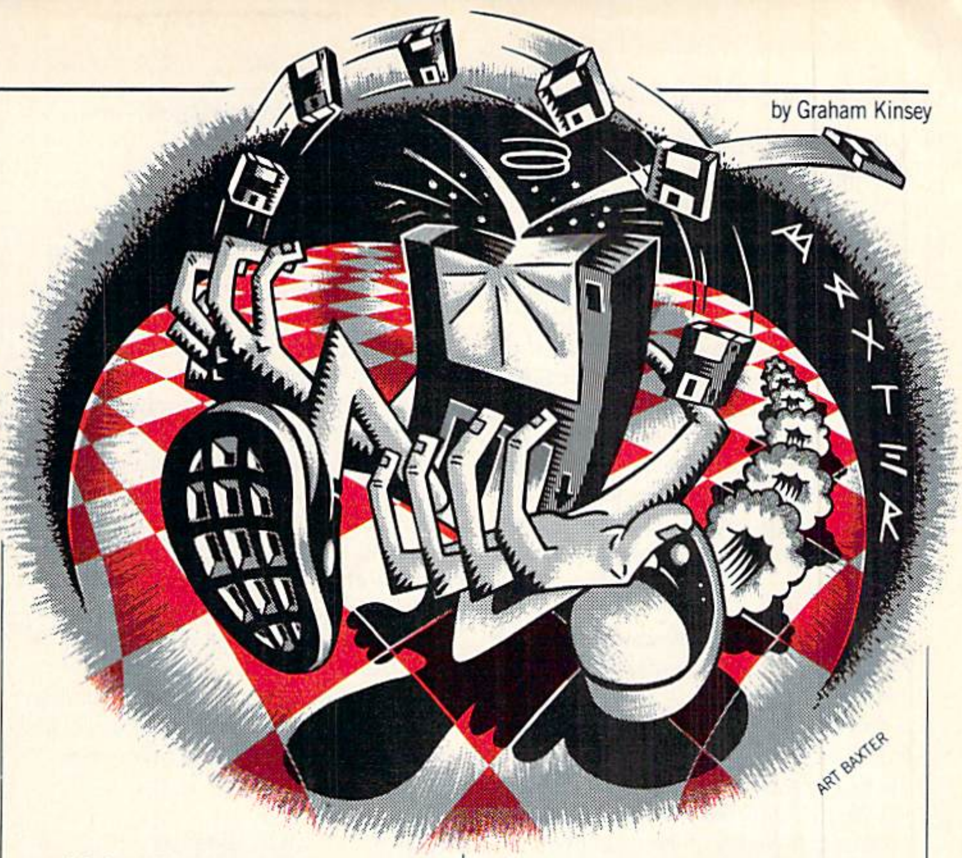
Many of the still video recorders and players have a serial port connector that offers the possibility of computer control. Kodak already has on the market a multi-disk unit that can handle up to 30 still video disks at a time with an image-to-image seek time that maxes out around six seconds. It can also be pre-cued for the next image. The multi-media possibilities are endless. So are the possibilities for image databases; 30 disks translate to 1500 separate field images, and Canon is working on a 12-inch optical disk recorder that uses the still video analog data format and can hold 54,000 images on a side.

Most of the current still video systems offer a horizontal resolution of around 320–360 lines. Horizontal video resolution (left to right) is generally scaled in lines, although it really refers to the number of pixels that can be resolved on a horizontal line. The vertical resolution (top to bottom) of video is fixed at 525 lines by the NTSC standard, although for various reasons as few as 300 or less may be discernable on many systems. A new Hi-Band still video standard has recently been announced that boosts the horizontal resolution to 500 lines. Be sure to read the specifications on any system that you intend to purchase, as at least one manufacturer is using the phrase "high band" while their horizontal resolution is specified at only 360 lines. As in all new technologies, more than a little confusion and marketing hype creeps in.

If you are interested in getting into still video, both Sony and Canon have consumer cameras on the market at well under $1000 list price. By the time you read this there may also be other manufacturers on the market with low-cost consumer cameras. Minolta has a still video back that attaches to their Maxxum SLR and converts it to a still video camera. Nikon, Casio, Olympus, Konica, Kodak and Panasonic have either announced consumer still video cameras or have industrial systems that may indicate an interest in producing consumer systems in the near future.

by Graham Kinsey

Amiga Public Domain



As promised, this month I have reviewed two great animations that require *two* megabytes in order to run. Other features this month include the first example animations from *Sculpt 4D* and *3D Professional* plus an important update to the great adventure game Moria.

For each program, the author is given when known. If I obtained a PD program directly from PeopleLink's AmigaZone, I list the AmigaZone download file number, so those of you who have access to PeopleLink and its AmigaZone can quickly download the file. (If no file number is given, the program may still be on PeopleLink, but I obtained it somewhere else.) When a public domain program has been classified as shareware, this is also mentioned, with the suggested amount.

Unless I specify otherwise, *all* animations reviewed here require one megabyte in order to run.

Monkey3D: by Peter Kurjan

This is a very nice *Sculpt* animation of a large monkey juggling bananas while running around in a circle. The animation includes a reflective puddle of water and some cute digitized sound effects. It's a refreshing change of pace from that old robot juggler.

54321: Author Unknown
(AmigaZone file #15542)

An ANIM format animation that essentially previews *3D Professional,* an animation package from Progressive Peripherals. This animation shows a set of animated 3D numbers with a very nice rendered chrome surface.

Walker II: The Trailer: by Brian Williams and Imaginetics, Inc.

This is the second animation demo from the people who created the incredible Walker animation (reviewed in the January '89 "Amiga Public Domain"). This is *not* the sequel to the Walker animation, but rather just a *preview* of what Walker II will be like when finished. Even in this preview it's easy to see that Walker II: The Trailer easily surpasses most other finished animations!

Walker II: The Trailer opens with an ominous view of the streets of Chicago at night. Then a helicopter gunship with searchlights ablaze is seen flying around the skyscrapers of Chicago.

While this seems normal so far, you soon see that this helicopter is flying above an AT-AT Walker (from the movie *The Empire Strikes Back* as well as the first Walker demo) which is on a rampage through Chicago. As soon as the gunship spots the AT-AT with its searchlights, it fires an intense salvo of laser blasts at the AT-AT. However, these laser blasts harmlessly bounce off the AT-AT's armor. Then the AT-AT fires a return salvo that hits the helicopter's engines, and in seconds the gunship explodes in a fury of heat and light. At the end you see the message: "COMING SPRING 1989 TO AN AMIGA NEAR YOU."

Throughout the demo some simple yet nicely-done title screens appear between the eight different scenes. Remember, this is just a trailer for the real Walker II demo; only about half of the screen area is used for the demo display. As a result, this reduces the effect of the demo on an RGB monitor. When I ran the demo on a seven-foot projection screen at a recent user group meeting, this demo received thunderous applause from the crowd! Needless to say, the finished Walker II demo (which should also include longer scenes) should receive plenty of praise from the Amiga community. The Walker II: The Trailer demo also requires two megabytes in order to run.

(NEWS FLASH: I have just learned that Imaginetics has released one megabyte versions of both Walker and Walker II: The Trailer, so those who have only one megabyte of memory can view scaled-down versions of these animations.)

DrZorb II: by Timothy Hanna
(AmigaZone file #15820-15823)

This is the sequel to the animation DrZorb (reviewed in July '88.) Although the DrZorb animation was a very good one, it bears little resemblance in terms of both content and quality to its successor.

When you click on the *Director* film icon, the first thing that happens is that you hear hideous laughter (almost identical to that heard in the ending moments of the original animation) while the animation loads. Next the title screen is displayed, which includes a digitized skull that falls to the bottom of the screen and breaks in two, to the sound of booming thunder.

Up to this point DrZorb II seems to be of the same haunting theme as its predecessor. But once the main animation sequence starts, you'll soon realize that DrZorb II is meant to tickle your funny bone rather then sending chills up your spine. When the curtain opens, You are presented with a surprisingly silly thing—skeletons dancing to Christmas music! Yes, the animation sequences are comprised of digitized complete human skeletons that take up the full screen in animation.

As for the music, well it isn't exactly "Jingle Bells." If you've ever seen the Bass

& Rankin Christmas show *A Year Without a Santa Claus,* you'll immediately recognize that these skeletons are dancing to the favorite theme song of that prince of pyrotechnics, the Heatmeiser! What's even more remarkable about the music is that it lasts for over two minutes (and we're talking about all direct sampled music here, not composed music). Needless to say, the end result is quite extraordinary.

DrZorb requires two megabytes to run (making it the first non-Imaginetics demo to enter the two-megabyte plateau). DrZorb II is yet another example of some of the wonderful things you can do with *The Director.*

Moria version 3.0: by Bryan and Richard Henderson (AmigaZone file #15421-15422)

The Hendersons have released version 3.0 of the very sophisticated fantasy role-playing adventure game Moria, which was featured in the October '88 installment of this column. There have been many improvements in Moria, but the most obvious one is that Moria is now *much* faster. When you are moving through a long corridor, it no longer takes a short eternity for you to get to the end.

While this improvement alone makes this a major upgrade, the Hendersons didn't stop there. Color codes have been added to all text messages in Moria, which makes it much easier to recognize what has just happened to your character (if you don't understand how important this is, then you have never played Moria for longer than three hours at one time). Likewise the mana and hitpoint displays are also now colored for the same reason.

The shopkeepers now no longer haggle with you after you've become a regular customer, which takes much of the monotony out of the game. You can now use the mouse for movement (which is quite handy in the town level) and to identify objects and monsters. A few graphic improvements have been made, including IFF screen additions, additions to how the dungeon walls are displayed and improvement in the town level graphics.

And finally, although it isn't mentioned in the documentation, the top dungeon levels now include a few powerful magic items that would not normally be there. This makes the beginning of the game much easier for the novice player and allows veteran Moria players to get a new character up to speed a bit quicker. Although these changes may not convert those who didn't like Moria, they make the game much more enjoyable for those who do.

4DAnim: Author Unknown (AmigaZone file #15623)

A very nice animation that shows off the power of Byte-by-Byte's top-of-the-line ray-tracing package *Sculpt 4D.* 4DAnim depicts a glass sphere within a glass sphere over a checkered floor. The animation is in the form of the familiar spaceship used in Allen Hastings' Infinite Loop videotape (which of course was ported from *VideoScape 3D* to *Sculpt 4D* via Syndesis' *Interchange* program) circling the two spheres. The resulting reflections of the spaceship off the two spheres provide a very interesting animation to say the least. While this animation sports few colors (mainly since the checkerboard is black and white), the apparent resolution quality (due to the use of HAM mode) and countless reflections made this a very good *Sculpt* animation.

Capitals: by Linda Marquess

A simple educational program for teaching state capitals using *The Director.* You can choose between one or two players and study mode or test mode. (In study mode the correct capitals are given when a question is answered incorrectly.) The program keeps track of a student's progress by coloring in a state on the map when the student gives the correct capital for that state.

Coupon Keeper: by Michael Bodin (AmigaZone file #15052)

A database program created especially for keeping track of grocery (or other) coupons. The supported fields are Brand Name, Product, Savings (amount), Exp.Date, Restrictions and Comments. While this program will do things like remove old coupons and perform searches, its most useful feature takes a grocery list that you have input and searches for all coupons that match up with items on this week's list.

Spectrogram: by Richard Horne

This program displays an audio spectrogram, or voice print, of any IFF sound sample. Once you load a sample, the program will compute a 256-point FFT (Fast Fourier Transform) and then graphically display the harmonics of the sample. You can then play back the sample at any rate. There is a cross mark on the screen that can be used to find out the frequency and time of occurrence of any plotted point on the graph.

Help: by Gerard Lachac

An Amiga port of the UNIX Help command. Help allows you to set up a documentation directory filled with documentation files from your favorite programs, then call documentation for any program just by running Help. Help requires arp.library installed in Libs: and that the More program be available as well.

Judy: by Ron Peterson

The Director has been used to create plenty of uncommon programs before—Judy is an example of a talk show created with *The Director.* Although there really isn't any animation to speak of, there are plenty of digitized scenes, sound effects and even a commercial (which I thought was the best part of the show). Also, if you enjoy talk shows that aren't exactly boring, you'll love what happens here. (Geraldo got off easy compared to the hostess of this show!)

Kick: by Tony Solomon and Paul Fortin (AmigaZone file #15124)

A cute display hack that shows what it was like to own an Amiga 1000 during 1985. NOTE: Make sure you aren't running any important programs that have unsaved data before running Kick.

PathAssign: by Anders Lindgren (AmigaZone file #15282; Shareware: $10)

If you've ever wanted to increase the size of your fonts or C directory but didn't have enough room on your system disk, then PathAssign is something that you need. PathAssign allows you to assign a directory like fonts: to multiple directories on the same, or even on multiple disks. The order you input for the target directories when you use PathAssign determines where AmigaDOS will look first for a particular file.

Those who have hard drives may still want to use this program, since you are now not forced to fit 100 different fonts into one directory (which can cause for a lengthy delay when getting directories, especially if use an AmigaDOS Dir alternative like LS that formats directory listings before displaying them).

Pass-the-Bucks: by Bob Dufford (AmigaZone file #15583; Shareware: amount not specified)

A personal accounting program. Basic features include multiple accounts, chronological journal display of transactions, percentage display of account values versus budget projections, net worth display, ledger displays, reconciliation of checking

accounts and credit card statements, account balances (with a choice of month, quarter or year-to-date values) and others. Options for an interlaced display and access to the PD program PopColours (used to change the colors of the screen) are also included in addition to many function entries in the menus.

RexxMore: by Carl Parramore (AmigaZone file #14952)

RexxMore is a short Arexx program that adds file requester support (using the ARP file requester, therefore arp.library must be present in libs: when running this program) to the Workbench 1.3 More text file display program. Those who have Arexx and use ARP can now have a text reader that can be used from Workbench while still being able to display text files that don't have icons attached to them.

Showfont version 3.3: by Arthur Johnson, Jr. (AmigaZone file #16011)

Version 3.3 of the font-viewing program Showfont, which was last discussed in the May '89 installment of this column. Several important bug fixes have been made, including what Arthur refers to as the "slider gadget's happy post-release flickering," which I had mentioned as a bug when I reviewed version 3.1.

The major new feature that's been added is that you can find out what key sequence you must press on the keyboard in order to have a particular font character rendered.

SnipIt version 1.2: by Scott Evernden (AmigaZone file #15127)

Version 1.2 of Scott's cut and paste text program SnipIt, which was first reviewed in the February '88 installment of this column. The major new addition is that the program now supports cut and paste to/from all windows (instead of just console windows), and the ability to insert a fixed prestring before each line of text is pasted (the prestring is user-definable).

SnipIt now has an option for changing the location of a text character cell (this helps to make SnipIt work successfully with non-console windows). You can redefine the control keys that activate SnipIt's operations from the command line. If you're trying to cut/paste text from a window that normally would scroll (for example, an online conference), SnipIt can freeze the window if necessary. A patch program has been included with SnipIt so that you can now use it with Dvorak, European and other custom keymaps.

Sorry!: Author Unknown (AmigaZone file #15299)

This in an Amiga port of the popular board game Sorry! from Parker Brothers. The game is 100 percent mouse-oriented, and includes menu options for up to four human and/or computer opponents, move suggestions and one-game play option. Game piece movement is very quick, and the graphics for the game are quite adequate. One interesting note about this game is that it was apparently written by someone at Parker Brothers, since the company's address is given in the program in case anybody would like to send in donations.

Jeff's-SS: by Jeff Marks (AmigaZone file #15015)

A set of text files (three AmigaDOS batch files and two MountLists) that can create a Startup-Sequence that asks you to choose between eight different RAD: configurations when booting. The options include no RAD:, a small non-bootable RAD: with or without the c: commands copied to it, and a full size RAD: with either nothing in it, or the contents of df0:, df1: or your *Scribble!* disk copied to it.

SysCheck: by Jim Butterfield (AmigaZone file #15170)

If you remember 1.2 at all, and had up to update your system disk(s) to 1.3, you may want to use SysCheck to make sure that all the files and commands on your system disk are indeed the 1.3 versions of those files. I understand why SysCheck doesn't check some files that don't change (like all the fonts), but I was shocked to find out that SysCheck doesn't check anything in the devs: directory. This fact alone basically defeats the purpose of SysCheck! While you can use SysCheck to check at least some files on your system disk, the program will *not* check all the important Workbench files that should be updated in order for the user to be confident that his entire environment has been upgraded to Workbench 1.3.

4Utils: by Arthur Johnson, Jr. (AmigaZone file #15956)

This archive contains four programs, but only two are unique and worthy of mention. If you have many programs that require many CLI commands to be executed before they can be run (C compilers, FRP games and *Director* animations are a few that come to mind), Setup and Shutdown can make life much easier.

With these two program you can create two large batch files (one called Setup and one called Shutdown) which contain setup and shutdown statements for many different programs that can't be run as is. Once you've done this, just run Setup, and the setup commands for the program you specified will automatically be executed. Then when you want to return your environment, just run Shutdown and all the reset commands that are needed to be executed will be run. While you do have to properly set up the Setup and Shutdown batch files yourself, these programs can make it much easier to run programs that require a certain environment be set up before they will work.

AutoMount: by Khalid Aldoseri (AmigaZone file #15844)

If you have more than one device to be mounted (including multiple hard disk partitions), AutoMount can shorten the time it takes for your Startup-Sequence file to run its course. Using the default method AutoMount will automatically mount every device listed in MountList (you can also force AutoMount not to mount a device in the listing by adding a text string before its name in the listing).

You can also specify via command-line arguments which devices should be mounted, instead of letting AutoMount mount every device it finds. There is also an option for floppy users that when invoked will tell AutoMount to load the Mount command and MountList file into RAM: before proceeding.

Galaxy: by Steve Riley (AmigaZone file #16000)

A C port of a BASIC program listed in the December 1988 issue of *Astronomy* magazine. This program simulates collisions between two galaxies.

For the stationary galaxy you can specify how many stars should be plotted (in terms of number of rings and stars per ring). For the intruder galaxy, you input the mass relative to the stationary galaxy, and the intruder's starting position and velocity. The display view is split into top and side displays.

While this program can give fascinating results, it hungers for added coprocessing power much the way ray tracers and Mandelbrot generators do.

Geotime: by Mike Smithwick (AmigaZone file #15666 and 15670; Shareware: $17)

Two very graphic clock programs. One of Geotime's clocks shows the earth from an orbital point of view with part of the

planet darkened. As time passes, the shaded area moves (it actually moves along with you, since your view rotates rather than the earth actually rotating). With this program you can tell the computer to place a marking spot anywhere on the globe.

While this clock is very nice, the best of the two clocks is the one that does an excellent job of simulating a Geochron. Geochrons are huge wall-sized clocks that depict a world map with the times of cities around the world displayed, all while part of the map is darkened to reflect what areas of the world are currently under the dark of night.

The Amiga version of this clock shows a very nicely drawn map of the world, with many cities labeled. Since Geotime uses a tiny font, it is easily able to display the name and time for each city without cluttering up the map. The darkened area of the globe is covered by a dark shape that—depending on the colors chosen and the monitor settings—may completely cover up the name of the city and/or the time for that city. Not only can you choose whether to display city names and city times, but you can even add new cities and remove default cities from one of the configuration files. While this clock takes up a separate screen it certainly is something to see in action.

SetCPU: by Dave Haynie
(AmigaZone file #15868)

SetCPU is a useful program for anyone who has an Amiga equipped with an A2620 (either inside an A2500 or as an add-on board) or a third-party 68020/68030. For all 68020/68030 boards SetCPU allows you to change various parameters of the cache, which may among other things allow you to run programs which normally crash under a non-68000-based machine. If you have an MMU on board, SetCPU will also allow you to copy the Kickstart code into the 32-bit memory (assuming you have any). This will speed operating system calls up to four times as fast as a 68000-based Amiga.

One important note I would like point out concerning *Director* animations (especially the DrZorb II animation): Apparently *The Director* is not compatible with accelerated Amigas in that when a *Director* animation with sound run on an accelerated Amiga, the animation portion of the program runs faster than the sound portion. The result can be an animation which seems to be really messed up. So if you're running a *Director* animation on an accelerated Amiga and it doesn't seem right, try running the animation on a 68000-based Amiga. I hope The Right Answers Group can fix *The Director* so that this will not be a problem in the future.

The Amiga PD '88 awards will be revealed to all in next month's issue of *Commodore Magazine!*

As always, I can be reached on the AmigaZone on PeopleLink (ID: G KINSEY), or on the IDCMP BBS (617) 769-3172 300/1200/2400 baud, 105 megabytes online, running 24 hours a day, addressed to SYSOP.

If you have written a public domain/shareware/freely distributable program, or have obtained one that you think is worth mentioning to all Amiga owners, please attempt to contact me via the above contacts, or through *Commodore Magazine.* See you next month.

To sign up to PeopleLink and their AmigaZone, call them at: (800) 524-0100 (voice) (800) 826-8855 (via modem).

For information on obtaining programs reviewed in this column send a SASE to: SMAUG, 1015 S. Quincy Avenue, #112, Quincy, MA 02169.

The Awesome Arcade Action Pack

Continued from page 28

hit a moving target generates a lot of laughter—from both sides of the puck. So my advice is to reserve *Blastaball* for play against another human—as an opponent the computer just isn't fair. If you just want to practice with the game's controls, select a two-player game and then master the craft's controls by maneuvering around a paralyzed opponent.

The three games are packed with a small, unimpressive-looking but important manual. My first impulse was to simply discard the thing and get on with the games. But, as tiny as it is, the manual contains some hints and information vital for completing the three games. I never survived past level one of *Xenon* until I stopped and read the scenario and weapons information printed in the manual.

I have two complaints with the pack. First each game is stored on a separate disk. I would have much preferred a single disk with a menu which allowed me to pick the game I wanted to play. Because the games are copy protected, you have to warm boot to switch from one to another, plus three disks take up three times as much storage space as one. Second, none of the games provides a save game option, so when your last life is spent, you have to start your quest from the first level again. I think both *SideWinder* and *Xenon* would be much more appealing if such an option were included.

Conclusion

Without exception, the graphics and sound effects on all three games match the best found on coin-operated arcade games. Of the three, my favorite is *SideWinder* not only because it is fast, but the images are beautifully sculpted and the sound effects are arcade perfect. While it is tough, even at the beginner level, it is not unbeatable.

On the other hand, I found *Xenon* almost too challenging for my taste. If you want to succeed with it you'll have to memorize the unique traits of each of the alien crafts you'll encounter and the attack patterns they fly. But still the game's almost addictive challenge, excellent graphics and digitized goodies hooked me into extra games (as a good arcade game should) time after time.

I both like and hate *Blastaball*. I like its close resemblance to a sporting event and the ability to compete against another human. But if I were restricted to playing against the computer alone, I would probably cram my fist through the monitor out of the pure frustration this one generates. I just can't beat the computer—but pit me against another sluggish human like myself and I'll hit the space ice anywhere and anytime.

I can't argue with the title's claim that the three games making up the *Action Pack* are awesome. All three games are top notch, and compare well with all the arcade games I enjoy. But I am a little confused about the last two words in the title—*Volume 1*. They suggest that another action pack is waiting in the wings. If so when is volume two going to be released? After seeing the quality arcade action packed here, I'm sure every joystick jockey in the Amiga community will be eager to unwrap a sequel.

If you divide the retail price of the *Awesome Arcade Action Pack* by three, the cost of each game breaks down to only $16.65—an arcade bargain on any system. And at that price, the games are not only awesome, but inexpensive to boot. *The Awesome Arcade Action Pack, Volume 1* is a golden collection that will delight every arcade lover. To answer my first question, the packs' name was born of confidence. The title accurately reflects the quality of the games—awesome.

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Jermaine: Why did you develop the *Designer's Pencil* program?

Kitchen: I wanted to do a baseball game, but Gamestar had recently been acquired by Activision and they already had a baseball game on the market. I was also tired of working on "little man" arcade games and wanted to do something totally different. Shortly after that, I came up with the idea of drawing a pencil on the screen and writing a little program to move it around. Things came together fairly quickly after that. Yes, this was the beginning of the *Designer's Pencil* project.

Jermaine: What led to the creation of *GameMaker: The Computer Game Design Kit?*

Kitchen: That's an interesting story. In 1985, we received a lot of mail from *Designer's Pencil* fans. In some cases, teachers were actually using the product to teach their pupils the principles of programming. However, most of the letters asked the same basic question: Can I actually design games with your program?

After reading this same response over and over again, I thought it was time to produce an arcade game development package that everyone could use. Keeping this in mind, I planned out a package containing five tools—a drawing program, background generator, sprite animator, music generator and of course, a sound effects utility. It would have a programming language similar to that of *Designer's Pencil* but more powerful and specifically designed for arcade game development. I actually thought I could finish this project in 18–24 months.

It soon became apparent, however, that I couldn't complete *GameMaker* on time, so we hired Alex DeMeo to work on the music and sound effects generators. Alex did a great job because he's a real musician and has a lot of talent when it comes to making music.

I did the overall language, the sprite utility and the background generator. Then there was a matter of creating sample graphics, animation, music and sound effects. If you're not artistically inclined, for example, we gave you 30–40 images to play with. *GameMaker* also featured sample games including a version of *Pitfall!* The project filled two sides of a disk and contained about 320K of data.

Activision wanted us to complete the program and show it to the world at the Chicago Consumer Electronics Show. This meant we would have to work on the project until the eleventh hour, so we didn't get much sleep leading up to the show. It got so bad that Alex said the sprites on the screen were actually talking to him. When they started laughing at him, it was definitely time to go home. We got the job done, and the program was well received at the show. Considering everything that went into it, *GameMaker* was a bargain at $39.95.

Jermaine: What is your relationship with Activision now?

Kitchen: We left Activision in 1986 and started a new company called Imagineering, Inc. Imagineering was set up to be a design firm that would work on microcomputer and video game projects for a number of different clients. Absolute Entertainment [a Mediagenic affiliated publisher] was founded a short time later. This label is used when we develop something and publish it ourselves. *X-15 Alpha Mission* was the first product bearing this label. Believe it or not, we purchased the program back from Activision and released it on the 64 late in 1986. [**Editor's Note:** *Most recently,* F-18 Hornet *was released under the Absolute Entertainment label.*]

The Mediagenic Metamorphosis 1987 to Today

In response to the company's expanding variety of product offerings, last year Mediagenic was formed to serve as parent company to all these diverse publishers. Loretta Stagnitto was able to bring me up to date on the reason for this new corporate entity and what's happening at the company today.

Jermaine: Tell me about the developments that led to Activision becoming Mediagenic.

Stagnitto: After the collapse of the video game market, Activision's fortunes changed. Activision was unable to successfully implement a diversification strategy, and the company lost money for four consecutive years. In January 1987, then senior vice-president Bruce L. Davis was appointed president and chief operating officer and took on the challenge of initiating a financial turnaround.

Davis was able to begin the turnaround by revising the product strategy to include producing more market-oriented software in popular categories (such as fantasy/role-playing, action and arcade-style games). He eliminated several products that were already on the market, as well as many under development. He also eliminated two unprofitable product lines—Personal Choice and Electric Dreams. (These lines were established or acquired by the former management as part of the diversification strategy and longer-term plan to become a diversified publisher of entertainment, creativity and productivity software.)

As a low-risk means of extending market share and expanding the product offerings, Davis started an affiliated publishers program, where Mediagenic began serving as exclusive sales and distribution agent for smaller independent software publishers. Hence, the company began offering entertainment and presentation tool products under the Activision, Gamestar and Infocom brand names.

This revised product strategy and other changes resulted in Mediagenic achieving two full years of profitability after four years of losses. To improve the profitability and encourage substantial revenue growth, the organization was restructured into two publishing divisions—Entertainment and Presentation Tools.

To signify the transition from a yearlong revitalization program and symbolize the expanding and diversified product lines, the company created the name *Mediagenic.* The new name also helped distinguish the company from the Activision product line, which was restructured to publish only action, arcade and simulation-style computer entertainment. Today, all sports simulations are published under the Gamestar label, while fantasy/role-playing and story-telling titles are released as Infocom products. Mediagenic serves as the parent organization to these numerous publishing entities. [**Editor's Note:** *see box on page 73 for a complete list of Mediagenic affiliates.*]

Jermaine: Who are the people behind the programs developed within Activision Entertainment Division today? Tell me something about each of them.

Stagnitto: The Activision line of computer entertainment is headed by Sherry Whiteley. She's responsible for strategic planning, product selection and development, positioning and the marketing of all programs published under that label.

In addition to Sherry, some of the key people in the Activision Entertainment Division include: Kelly Flock, product marketing manager; John Skeel, producer; Mark Johnson, producer; Mike Suarez, producer; and Kelly Zmak, product specialist.

Activision is also the name used to market the company's video game titles for the Nintendo Entertainment System, Sega Master System and Atari 2600 and 7800. Chris Garske heads the Activision Video Games Division.

Activision Celebrates A Memorable Decade

Sherry Whiteley (general manager) and Kelly Flock (product marketing manager) have their own stories to tell. Here are their versions of what is happening at Activision Entertainment these days.

Jermaine: Tell me what it's like to work at the company today.

Sherry Whiteley: I love working for Activision Entertainment because it gives me the opportunity to work with seasoned professionals. These individuals care about producing high-quality products and provide a people-oriented work environment where everyone is encouraged to participate. But somehow these people remain children at heart. My imagination is constantly running wild around here. Creativity is always appreciated, and fun is a way of life at the company.

Kelly Flock: Toys and games can be found in everyone's cubicle. No one is willing to grow up and forget what it means to have fun. The best products—the ones that are the most fun to play—are generated in this type of environment. No one wants to create a program they wouldn't want to buy themselves.

Jermaine: Can you give me some information about your product line strategy?

Whiteley: Activision puts out action arcade, adventure, simulation and strategy products. We are committed to publishing high-quality software in all popular categories. Products that do not meet our standards are quickly cancelled or sold off to other publishers.

Flock: The company released its first simulation product—*F-14 Tomcat* in February of this year. In *F-14,* you get the realism found in most flight simulations, but it's a lot more fun to play. *Fun* is the key word here. We conduct studies to determine what the "fun" and "exciting" elements of a simulation are. Then we construct a game around these factors, instead of modeling every aspect of the project after the real thing. The final product contains the best of both worlds.

Jermaine: Can you share a few stories about some recent game releases?

Whiteley: *Ocean Ranger* was submitted to us on the 64 by a brand-new development group. The product arrived one day in the mail. Our producers simply could not believe a product of that quality, nearly complete, would come by regular mail. We quickly called the developers and worked out a deal to acquire the product. A port to MS DOS commenced shortly afterward.

Shanghai, an award-winning puzzle game based on the ancient oriental game of Mah-Jongg, was developed by Brodie Lockard. Brodie worked at Stanford University, writing educational software for use in classes there. He earned both a Bachelor's and Master's degree at Stanford and while studying there was a member of the varsity gymnastics team. He had an accident while on the team and was rendered a quadraplegic. Shortly after his accident, Brodie became interested in the game Mah-Jongg. He saw an opportunity to design and produce a similar game on his personal computer, which came to be known as *Shanghai. Shanghai* has since been published on more than 30 computer systems worldwide and is a popular arcade game in Japan. *Shanghai* remains one of Activision Entertainment's most popular titles.

Rampage has become a mega-hit title for Activision. Kelly Flock, the product manager, gave his people a special incentive to get the 64 product shipping on time. He bet his development and test team that if they made their deadline, he would get a Mohawk. Luckily for Kelly, the group missed their deadline by two days.

Technical support receives a lot of calls from *Predator* players. It seems that most of them don't know how to win the game once they meet the "predator" in the final confrontation scene. We recommend watching the movie because it contains a clue to solving this mystery. Another clue: the player must pick something up and use it as a weapon.

Getting the programmer to finish *The Last Ninja,* was a tough job. One day he decided that he needed a stress reliever. So he hopped in his car, drove to L.A. and spent the day at Disneyland. He didn't tell us about the trip, so we feared the worst when he didn't return our calls. Little did we know he was simply visiting Mickey Mouse. By the way, *Last Ninja 2* for the 64 will be on the market by the time you read this.

I recently heard a tale about *Chop 'N Drop.* During the final testing of the product, our people made an unusual discovery. The original programmer had added a special feature to the game for the amusement of players who happened to stumble across it. If you press a certain combination of keys all at the same time, the characters in *Chop 'N Drop* will drop their pants. However, You really don't notice it much because the figures keep right on chopping away at each other. This is a nice little challenge for the consumer who wants to try something different, and the graphics are not X-rated.

Jermaine: What's going on at the company today?

Whiteley: One of our product testers has an interesting hobby. For inspiration, he covers his wall with the most bizarre tabloid headlines you've ever seen. Two of my favorites are "Adolf Hitler Was a Woman" and "Cheeseburger Kills Space Alien." I wonder how this inspires our wacky testers? By the way, our testers still favor the original Atari 2600 joystick over all others on the market today.

How does our graphic artist feed his creativity? He adorns his office area with various "blow-up" creatures that hang from the ceiling. Some of his groupies include ghosts, skeletons, dinosaurs, clowns, snakes and even an alligator.

Some of the folks in technical support are receiving strange phone calls from people they've never met asking for advice on things other than their programs. There is a 14-year-old boy, for example, who calls to discuss the problems he's having with his girlfriend. We never thought it was necessary for our technical support teams to take a course in psychology until now.

Jermaine: Is it true that Activision has perfected a laser disc game?

Whiteley: We recently released the first entertainment CD-ROM title, a graphic adventure game running under Hypercard on the Macintosh computer. The product was called *Manhole.* It contains over 50 Mbytes of code and features 30 original songs, many of them recorded at a professional music studio with live musicians. There was nothing on the market like it, or even close, so people had a hard time comparing it to other things.

Many lengthy conversations went on internally, but we decided if Activision Entertainment was going to be a market leader and innovator, the company had to take chances when it saw glimpses of the future. *Manhole* was finally published, and the story has a happy ending. The product is successful beyond expectations, and Activision is once again on the cutting edge of technology. In the future, you may see this game (and similar products) available for other computer systems.

Jermaine: Do you have other CD-ROM projects on the drawing board?

Whiteley: You'll have to wait and see.

Jermaine: What are your five top-selling entertainment products of all time?

Whiteley: Believe it or not, all five of these titles are video games. The market for video games is much larger than for computer games. It's possible to sell more than a million units of a single title world-

wide. *Pitfall!*, *River Raid*, *Laser Blast* and *Freeway* all fit into that category.

The five top-selling Activision computer games in reverse order are (5) *Rampage*, (4) *The Last Ninja*, (3) *The Great American Cross Country Road-Race*, (2) *Hacker* and (1) *Ghostbusters*.

Next: *Ghostbusters II*

Mark Johnson (an Activision producer) gave me the details on the sequel to Activision's best-selling computer game ever.

Jermaine: How did you obtain the rights to develop another *Ghostbusters* game?

Mark Johnson: It was the result of our previous arrangement with Columbia Pictures. We knew there was another *Ghostbusters* movie in the works, so it seemed like a good idea to create a sequel to *Ghostbusters* [the game]. By the way, it will closely follow the events of the new movie.

Jermaine: Where does the story take place?

Johnson: Once again, our heroes are traveling around the streets of New York City—Manhattan to be precise—and visiting the Statue of Liberty.

Jermaine: What is the sequel's storyline?

Johnson: Everything revolves around the portrait of a wicked medieval ruler named Vigo the Carpathian. This guy was a real slime ball (no pun intended) in his day. He is coming back to life, due to the restoration of the painting, and intends to rule the modern-day world in a truly evil fashion. The ghosts are his instruments and are somehow tied to a river of green slime that flows beneath the city. This river is gradually growing in size because of "bad vibes," i.e., the New York stereotype of meanness, etc. The Ghostbusters use the Statue of Liberty (a sign of "good") to defeat the ghosts, green slime and Vigo.

Jermaine: When will the game be released?

Johnson: The game will hit the market a few months after the movie. *Ghostbusters II* (the movie) is scheduled for release on June 16. Incidentally, *Ghostbusters II* (the game) is currently being developed for the Commodore 64 and a variety of other systems.

As I wrap things up, I'd like to thank the Mediagenic employees past and present for taking time out of their busy schedules to share the secrets of their company. It's been a pleasure to work with all of you.

Mediagenic Affiliated Publishers

Absolute Entertainment
Affiliated publisher since August 1987
Products include: *Crossbow* and *F-18 Hornet*

Interplay Productions
Affiliated publisher since March 1988
Products include: *Neuromancer* and *Battle Chess*

Company-Owned Publishers

Infocom
Products include: *Zork Trilogy, Zork Zero, Battletech, Shogun, Quarterstaff* and *Journey*

Gamestar
Products include: *Pete Rose Pennant Fever, Take Down*

Activision Entertainment
Products include: *Rampage, Last Ninja 2* and *F-14 Tomcat*

Activision Video Games
Products include: *Stealth, A.T.F., Three Stooges,* and *Bomber Raid*

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Activision Commodore 64/128 and Amiga Computer Titles

Product List in Chronological Order of Release

Titles	Format	Release Date
Pitfall	C64 Disk	5/84
Beamrider	C64 Disk	5/84
The Activision Decathlon	C64 Disk/Cart	6/84
Pitfall!	C64 Cart	6/84
H.E.R.O.	C64 Disk	6/84
Toy Bizarre	C64 Disk	6/84
Pitfall II	C64 Disk	7/84
Beamrider	C64 Cart	7/84
Zenji	C64 Cart	7/84
Toy Bizarre	C64 Cart	7/84
Pitfall II	C64 Cart	8/84
H.E.R.O.	C64 Cart	8/84
Zone Ranger	C64 Disk/Cart	9/84
Zenji	C64 Cart	9/84
Park Patrol	C64 Disk	9/84
Designer's Pencil	C64 Disk/Cart	9/84
River Raid	C64 Disk	9/84
Space Shuttle: A Journey Into Space	C64 Disk/Cart	10/84
Ghostbusters	C64 Disk	10/84
River Raid	C64 Cart	10/84
Pastfinder	C64 Disk/Cart	11/84
Tracer Sanction	C64 Disk	12/84
Mindshadow	C64 Disk	12/84
Rock 'N Bolt	C64 Disk	2/85
Master of the Lamps	C64 Disk	3/85
Web Dimension	C64 Disk	4/85
Alcazar: The Forgotten Fortress	C64 Disk	5/85
The Complete Fireworks Celebration Kit	C64 Disk	6/85
Countdown to Shutdown	C64 Disk	7/85
Fast Tracks	C64 Disk	9/85
Little Computer People	C64 Disk	9/85
The Great American Cross Country Road Race	C64 Disk	6/85
Hacker	C64 Disk	8/85
Borrowed Time	C64 Disk	11/85
Hacker	Amiga	11/85
Mindshadow	Amiga	11/85
Garry Kitchen's GameMaker: The Computer Game Design Kit	C64 Disk	11/85
Borrowed Time	Amiga	12/85
Alter Ego (Male)	C64 Disk	2/86
Music Studio	C64 Disk/Amiga	4/86
Murder on the Mississippi	C64 Disk	5/86
Alter Ego (Female)	C64 Disk	5/86
Little Computer People	Amiga	6/86
Filer's Choice	C64 Disk	6/86
Writer's Choice	C64 Disk	6/86
Planner's Choice	C64 Disk	6/86
I Am The C-128	C128 Disk	6/86
The Personal Choice Collection	C64 Disk	6/86
Hacker II: The Doomsday Papers	C64 Disk	7/86
Hacker II: The Doomsday Papers	Amiga	8/86
Tass Times in Tonetown	C64 Disk	8/86
The Transformers: Battle to Save the Earth	C64 Disk	9/86
GameMaker Designer's Library: Sports	C64 Disk	9/86
GameMaker Designer's Library: Science Fiction	C64 Disk	9/86
Shanghai	C64 Disk	9/86
Tass Times in Tonetown	C64 Disk	9/86
Shanghai	Amiga	10/86
Paper Models: The Christmas Kit	C64 Disk	10/86
Labyrinth: The Computer Game	C64 Disk	10/86
Howard the Duck: Adventure on Volcano Island	C64 Disk	11/86
Aliens: The Computer Game	C64 Disk	11/86
Greeting Card Maker	C64 Disk	11/86
Term Paper Writer	C64 Disk	11/86
Portal	Amiga	1/87
Postcards	C64 Disk	9/87
The Last Ninja	C64 Disk	9/87
Gee Bee Air Rally	Amiga	10/87
Rampage	C64 Disk	10/88
Ocean Ranger	C64 Disk	8/88
Predator	C64 Disk	11/88
Chop 'N Drop	C64 Disk	11/88
F-14 Tomcat	C64 Disk	2/89
Rampage	Amiga	3/89

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phase that your movement of officers and legions into surrounding regions meets success or failure. Here you are more of a spectator than anything else and must view events unfolding on the regional map with a calloused eye. A cursor will appear on the maps and begin moving about as various forces attempt to invade surrounding areas. Meanwhile, messages will be displayed as the results of battles are tallied. Some battles will rage over many years (turns), so the results of such campaigns may be inconclusive from one turn to the next. More often that not, however, the strength of your army and the strength of the barbarian army will appear, and battle will be swiftly resolved.

When the cursor comes under Roman control, you will have the chance to assign officers and Roman troops to the fray. The troops available to you can be Legionnaries (home-grown Roman soldiers), Auxilaries (non-Roman soldiers led by Roman officers), or Limitanei (garrison troops equivalent to Auxilaries). The makeup of your forces will depend on recruitment, which is accomplished during the economics phase (not under player control). All regions allow for recruiting a single type of Roman solder, as discussed above. The makeup of your forces will also impact how effectively your forces fight. For example, Legionnaries are more effective than Auxilaries in battle. If Rome is sacked—which will happen quite often in the beginning—you can move your captital to another region over which you have control. But getting sacked normally signals the beginning of the end.

Additionally, events on the screen can be difficult to follow, as you must become very familiar with the regional codes and the map before you'll begin to feel confident with the program. Apparently, the creators of this program did an immense amount of research. On the map included with the documentation you'll not only find the identifiers for all the regions, but the actual invasion routes used by many of the nations. You'll also notice that many of the events that unfold across your monitor actually parallel those of history. The Gauls and Cathaginians, for example, will remain heady adversaries during the beginning stages of the game, just as they were back then. You may also find several petty empires rising and falling outside the influence of Rome as the game progresses.

Any criticism toward *Annals of Rome* is not founded on functional cosmetics or game play, but rather the end reward for playing it. The goal of this program is to prevent the sacking of Rome which, as history tells us, must surely happen; and it will—at one point or another. So the goal of *Annals of Rome* is to delay Rome's eventual fall as long as possible. Because history often repeats itself, you'll find that no matter what steps you take, or how long you hold out, Rome must indeed fall into ashes, if only because of the growing sophistication and restlessness of the European, Asian and Arabic nations which surrounded her. In the end Rome became—and will become in this game—a bloated, corrupt, bankrupt and over-extended nation that had to rely on non-Roman soldiers and officers for protection. In the end, the fall of the empire became inevitable. So why invest so much time in a game with such predictable results waiting for you?

As I've said before, for much of the game—aside from assigning officers and legions to regions—you are more of a spectator than an active participant. You have no control over the various campaigns or battles, and must rely on unseen predetermining factors for much of your success. Historical events and probability also play a big, yet unseen, factor.

The documentation does not expound on some of the more critical areas of the game and provides very little information on *why* things happen as they do. Moreover, the order in which the game's instructions are presented seems ill-organized and sometimes immaterial to game play. Be prepared to spend an inordinate amount of time sifting through the booklet to glean needed information that could have been better centralized to one or two pages.

The graphics are not dazzling by any means, but war games have never been known for their pretty pictures. You will discover, however, that the characters used on the personnel rosters try to simulate 80-column graphics and are very hard on the eyes after an hour or two.

Annals of Rome is interesting in that it shows history can be replayed if the right circumstances permit. Being a history buff, I found it intriguing in that respect. More traditional wargamers will quickly become frustrated by the limited control over military operations, and may want to look elsewhere. Someone once quipped that Rome wasn't built in a day. Any measure of long-term success in *Annals of Rome* may take just about as long to build.

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they have planned a tentative storyboard (showing the important events to be included in the video), they shoot the live video which will normally comprise the bulk of their production. Next they go back to the studio to view the tapes and decide exactly what they will cut and what will remain. Then they'll make any necessary changes to the storyboard. Now they are ready to sit down at the Amiga.

First they create the title and credit screens and select fonts and transition effects to use. Any special animated sequences featured in the video will be created next. Because video production is a business, Chandley says the extent of the special effects he includes depends on what the client wants and how much they are willing to pay. While most of his clients are happy with professional titles, credits, labels and transitions alone, he says he will happily spend 12 hours creating 15 seconds of sculpted animation if that's what the client wants.

The special effects really take the time said Inman, although the basic titling screens can be generated almost instantly. To give his creations a professional look and make a lasting impression on his clients, Inman used *Cel Animator* to create an animated signature title (with a company called Captain Video you can imagine the fun he had with his own logo) which his clients seem to enjoy. As a promotional bonus, the signature title leaves his electronic business card anywhere the video is shown.

Once the computer-created special effects, live video and final version of the storyboard are ready, they can mix the two sources (taped video and computer signals) to produce the final video. While the live video is sent through the editing deck, the special effects are loaded into the Amiga, ready to be merged via a genlock device (during the editing process, you can stop and load dozens of different special effects). An NTSC monitor displays what the recording head is receiving from the editing deck and the genlock. Finishing the video is as simple (or as frustrating) as flipping between or mixing the two signals. The magic of a genlock is that not only does it translate the computer signal into a steady NTSC image, but it also allows the producer to superimpose one image over another. The end result is a broadcast-quality product complete with impressive transition effects (dissolves, wipes and scrolls).

"Broadcast quality" must be the watch words of anyone who wants to do videos commercially. No matter how good your ideas, if they do not meet the standards required for broadcast, you are wasting your time. Not too long ago, broadcast video required ¾-inch format tapes and expensive ¾-inch TV cameras. Because of improvements in videotape, that size requirement has shrunk. Inman uses a ½-inch Super VHS camera, while Chandley satisfies his customers with the tiny new 8mm Sony format.

The End Product

Once you have your system in operation, and you've mastered the hardware and software (and providing you have the talent required to come up with good ideas and translate them into a final product), you are ready to recoup your investment. Although a full-length video movie is not beyond the possibilities of the pro studio we described, most people will achieve more success by aiming their sights a little lower.

To be successful, John and Bruce agreed that you have to be flexible and imaginative. Inman does a lot of in-house promos and employee training videos for industry, while Chandley has just signed a contract with a local cable channel. Neither turns down requests for wedding videos either. Depending on where you live, producing just four or five average wedding videos could easily generate enough income to recoup your hardware investment.

At the time of our interview, Inman was in the process of completing a commercial/promotional video for a local business as well as a safety training video for the area electrical company. Chandley had just finished a promo for a ski resort and was lining up some in-house instructional videos for a motel chain. In short, restrictions on where and how to make money with video productions appear to be limited only by the producer's imagination and talent.

Of course, lots of us just want to bring life to digitized still photos from the family album or add some fun and sparkle to last year's trip to the beach. The hardware and software tools are ready, what you do with your video studio depends entirely upon your ambition, motivation and talent.

Video Paradise

When I began this article I planned to interview a couple of video producers, tell you how to set up your own video studio, offer some advice on how to market your videos and end by highlighting the best video-related software packages. But the more I learned about the complexity and power of video and the role the Amiga can play in its creation, it became apparent that this was not going to be as easy. I found myself physically smothered under an avalanche of video software titles (see page 81).

My first effort to get some breathing room was to eliminate all but the really impressive titles. But even after doing that, I was still left with an intimidating number of programs—too good to be ignored, but too complex to cover properly in a few sentences. When it comes to video, the Amiga user is blessed with a bounty of programs from which to choose, in a price range which spans from under 60 to over several hundred dollars. The real problem any user wanting to produce serious videos must face is deciding on software. I can say with all honesty that every product mentioned in "Tools of the Trade" is worth owning. And that's the problem. Normally in a "roundup" article like this, I like to point out programs I think the user should buy and those they should pass up, but this time I can't. And to make the dilemma more perplexing, even as you're reading this, new titles are being added the video shelves. So this time I'll just mention the good ones I have tried and leave the choice up to you.

Coaxing a Video To Life

Chandley and Inman suggest (and my own experience leads me to agree) that any newcomer to the Amiga or video production should avoid buying too many titles too quickly. The sensible approach is to start with good paint and titling programs. Both are indispensable tools for serious video production for obvious reasons. Next add an animation program for squeezing out unique, client-pleasing clips. Once you have mastered these three programs you'll want a sculpt program to add three-dimensional sophistication to your productions. I suggest you attempt 3D design last, because even the best 3D program can be cantankerous to subdue.

Without exception, the character-generating software for the Amiga is simple to use and straightforward in design. There is no reason anyone should have trouble adding impressive, animated text to their videos using the Amiga.

All of the animation programs I've seen have rendered delightful results, but some are easier to handle than others. As an example, you can generate some amazingly sophisticated sequences with *The Director,* but you must first master a BASIC-like language. If you already feel comfortable with BASIC, this is an obvious candidate for you. But if you are new to computers, for a little more money you might prefer an animator like *MovieSetter, Cel Animator* or *Fantavision*. All are amazingly simple, since all the options are selected from screen tool boxes or pull-down menus—you just click and animate.

Anyone who has witnessed the impressive, realistic quality of a three-dimensional rendered animation, will be drawn like a moth to a flame once they witness a sculpting software demo. And that's why I suggest you wait until last to add 3D software—you can get your wings burnt trying to get your own renderings to fly. The problem is not the software, the problem is learning to think in three dimensions at once and then translating those thoughts to a two-dimensional computer screen. Mastering even the best of these requires a lot of patience and time. But don't lose heart, every single package now on the market has gone through at least one upgrade in an effort to reduce the learning curve required to master it. Along with friendlier interfaces, the new batch of 3D rendering software is not only easier to use, but in most cases is faster and offers more features. My personal favorite is Aegis' *Videoscape 3D* when used in tandem with *Modeler 3D*. But my preference is probably biased due to familiarity. After spending a little time with *Turbo Silver* I was impressed with its speed and quality, so I may change my mind. For the buyer, the important fact is that 3D programs are constantly improving and getting easier to use.

The Bottom Line

John Inman's professional video studio contains in excess of $16,000 worth of equipment. Inman is proud of the way he paid for it all. He says that even while he was establishing his business, "none of the money required to buy equipment came from grocery money." Living by the tenet "pay as you go," Inman steadily expanded his business with money generated by videos. This year his hard work has paid off; he has a mortgage-free, profitable business as well as top-notch equipment.

Chandley, on the other hand, jumped into video with both feet. He left his old job as a radio announcer, bought all the equipment he needed to go into production and started looking for clients. He says there were some months when he was a little nervous because there was little work (and even less money) coming in.

Profitable Video

Bruce used those slow times to learn more about his equipment and the Amiga, so when the next job came, he was better prepared to handle it. Despite a few slow months, his company broke even the first year, and he's confident the lean times are behind him.

After spending some time with Inman and Chandley and the different software packages, I was both amazed and dazed at the state of personal video and at what a driving force the Amiga has become. I can remember hearing lots of predictions in 1985 that the Amiga would be to the desktop video industry what the Macintosh was to desktop publishing. I didn't pay much attention to the hoopla then, but after seeing what the system can do today and the success both John Inman and Bruce Chandley have had, I'm ready to jump on the DTV bandwagon.

Making Them Sit up and Listen

So far we haven't discussed adding music or sound effects to a video. With the animation software at least, sound effects or digitized music can be added directly via system options. But creating your own sound effects or music to add to a video is a subject worth an article in itself. Of course, the quick fix for adding sound to a video is to simply dub over the video's soundtrack. But many of you will want to create or capture unique sounds and music with your Amiga—for use with your videos as well as other applications. So stay tuned, next month we will talk to some users who are composing and performing with the Amiga. And they will tell you how to perk up your Amiga's speakers.

To Be Continued . . . .

The video production companies featured:

Captain Video
John Inman, owner
162 Twin Lakes Drive
Candler, NC 28715

Focal Point Productions
Bruce Chandley, owner
Box 414
Asheville, NC 28801

Tools of the Trade

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good video software for the Amiga user. If anything, a would-be video producer may have difficulty deciding which programs to buy and which to pass up since there are so many from which to choose.

Overwhelmed, Amazed and Impressed

As I investigated Amiga video software I experienced three sensations: (1) I was overwhelmed by the number of programs. There are many choices in every software category. (2) I was amazed at the professional quality of each. Although the power levels of the programs span from home use to broadcast use, the display quality of each was outstanding. (3) I was impressed by the support of the developing companies. In the past I've come across companies that have brought a product to market in hopes of reaping a quick profit and then moved on, abandoning their customers. But all of the Amiga video developers I've met seem convinced that the video production industry is still in its infancy and that the market for computer-aided graphic programs will continue to widen.

True to this vision, most of the companies have not only expanded their product lines in the past year, but have also updated and enhanced earlier programs to satisfy the increasingly sophisticated demands of their users. For the Amiga user these facts translate into plenty of quality production tools to choose from, as well as good technical support after the purchase. You might call that a video producer's paradise.

The remarks which follow should not be misconstrued as anything other than an effort to highlight the products I've seen in action. The single most frustrating dilemma in finishing this article was deciding which software to mention and which to pass up. No sooner would I feel I had tested all the serious programs when I would hear of another new entry in the video market. Because the development of desktop video programs appears to be a never-ending saga, I conceded that if I was ever going to finish this article I simply had to stop. Here are a few words about some great products which I was able to try:

Titling Software

Pro Video Plus: The reputation of *Pro Video Plus* speaks for itself. When I asked Inman and Chandley what software they recommended for anyone wanting to set up a video studio the first title mentioned was *Pro Video Plus*. According to them, not only is the program powerful but it is easy to use. Inman, who had owned his Amiga for less than a month when he added this character generator to his system, says he was doing serious work with the program in less than an hour. Coming from a person who was new to the Amiga computer, such praise speaks well of the program's interface. Recognizing that the user wanted a tool, not a toy, the people at Shereff Systems created a program which offers every feature a professional could want, including: full-screen video, 16 colors per page, 16 fonts (you can add others from other vendors), multi-colored characters, 90 special effects, transitions and line-definable moves. For backgrounds the user can load any IFF picture or use live video.

Both of our experts use the program almost exclusively for titles, credits and live video labels (inserting identifications under images like names of people or products). Chandley is using *Pro Video Plus* to create stunning, professional-quality displays for a local cable network. Inman uses it to add credits and titles to his clients' promos and in-house training videos.

Both say they picked *Pro Video Plus* because of its quality. "Clients judge my work by its appearance. If it looks professional they are happy," said Chandley, "and to be professional, text and transitions must look as good or better than those on the major networks."

Video Titler: This titling program supports all possible Amiga screens except HAM. The program will work with either standard Amiga fonts, color fonts or its own special poly fonts. Poly fonts are useful because they can be easily sized, expanded, compressed or squeezed in any direction for some really nice displays. Plus you can adjust your fonts with 20 different special effects. Beyond just generating characters, the program includes plenty of transition tricks as well as a utility program called VideoSeg which is used to play back screens.

TV*TEXT: Even though this character generator is the least expensive on the market, it has plenty to offer the beginning video producer. It supports every screen resolution offered by the Amiga, and allows text to be rotated, justified and animated. The user can even define the spacing between the lettering as well as the size, color and font.

Screen Display Software

TV*SHOW: This was one of the first screen presentation software products released for the Amiga, and it's still a favorite for good reason. It offers 50 image transition effects, supports speech, color cycling and overscan displays.

Lights! Camera! Action!: The program boasts 40 transition tricks, supports both standard music and digitized files, HAM

display screens, and animated sequences which use the ANIM format. But most users will choose *Lights! Camera! Action!* to create electronic slide shows using either digitized images or drawings created with a paint program. There are no image-creation or editing options here. The program uses a script to establish the sequence in which different effects, sounds and images will appear. At first glance, the script editing screen may intimidate some users, but it shouldn't. All the program's features can be selected and activated with the mouse.

Animation Software

Aegis Animator: No single company has supported the Amiga's desktop video needs more completely than Aegis. They were among the first software developers to recognize and embrace the computer's capabilites and have marketed powerful tools to address every need of a video producer. Because of their early support of desktop video it is no surprise that my first experience with animation came through an early version of *Aegis Animator*—a program that still impresses me.

The program's greatest strengths are two of its movement techniques called "cel" and "metamorphic" animation and its easy-to-master command interface. The power of metamorphic animation is that it lets you create objects in one scene, then redraw the same object in a second scene, and the program will automatically and smoothly generate the transformation scenes required to animate the changes. Using cel animation, you can create or load standard IFF files and then "flip" them to create stunning animations.

Once you feel comfortable with *Animator* you can use a standard ASCII text editor to create or edit animation scripts. *Animator*'s greatest weakness is that it does not provide a simple option for incorporating sound effects or music.

DeluxeVideo: You cannot talk about Amiga graphics long without mentioning one of the premier programs supplied by Electronic Arts. Even after four years of change, *DeluxePaint* (first introduced in 1985) continues to be the paint program used by most serious artists creating backgrounds and images for animation. With such impressive credentials it was no surprise that EA's first video offering, *DeluxeVideo,* was so quickly accepted.

I got my first glimpse of *DeluxeVideo* at the Consumer Electronics Show in 1987. After seeing how the program could be used to create animated images to rival those shown nightly on prime-time TV, it is easy to see why this program is so popular. You can create animated sequences with images moving in all directions, complete with background music and digitized sound effects. And, of course, there are plenty of screen transition options.

DeluxeProductions: For the professional animator *DeluxeProductions* includes the ability to combine high-resolution graphics with animation. Animation is managed with a professional storyboard simulation which tracks the director's commands. The program has almost every option a serious video director could want, including overscan, animated title options, broadcast-quality fonts and the ability to chain productions to create lengthy or looped presentations. And to give the displays a professional appearance, it supports hi-res, a full palette of 4096 colors, over 40 special effect wipes, fades and transition options.

MovieSetter: *MovieSetter* from Gold Disk, is one of the newest animation programs to come to the market. If I could say nothing else about the program I would have to say it is easy to master. The animator is designed around a what-you-see-is-what-you-get approach. Thus, you see and hear changes to the scenes as they are developed. As backgrounds are loaded, characters are moved or sound effects added, the changes are reflected both visually and audibly. To wrap all this complexity around an icon-activated interface, which is truly intuitive to use, is a welcomed surprise. After playing with the program's command interface for just a few minutes, it became apparent that the developers had taken notice of user gripes about the interfaces used by other animators and tried to make *MovieSetter*'s command interface better. The program includes options to create images, animation speeds up to 60 frames per second (for super smooth action), stereo sound, a choice of 32 colors and overscan. [***Editor's Note:*** *for a complete review of* MovieSetter *see page 34.*]

Photon Video Cel Animator: This animator allows you to use screen resolutions ranging from 352 × 240 to 704 × 480 pixels as well as HAM and interlace. The program will work with any IFF image and includes some basic paint editing tools which the user can select to fine tune an imported drawing. This means you can import a frame of your movie and then duplicate it to the next frame where you can alter its design slightly to create the illusion of movement (which will appear when you show the movie). The final animation is compressed before being saved to disk, so the movie's size is less than the total of the bytes required to create it (separate IFF files).

All of *Cel Animator*'s commands can be invoked with either the keyboard or with the mouse. After you become familiar with the program, you'll probably intuitively turn to the quick access of the keyboard. The program allows you to selectively activate digitized sound effects over frames of the movie as it is shown. I found *Cel Animator* a delightful, powerful, full-option animator with intuitive design that happily disguises its true complexity.

Although the program's manual is easy to understand and includes a wonderful tutorial, it suffers from a lack of index and few illustrations.

The Director **and** ***Toolkit:*** This animation software system uses a special language very similar to BASIC to page flip images, generate text, activate animation sequences and cycle color. If you are already comfortable with BASIC, this is definitely a program to consider.

For the price, this one is packed with power as well as support for both HAM and overscan displays. Providing you have the talent, this program can help you create videos to rival those produced in Hollywood studios.

The *Toolkit* utility pack adds some new wipe routines, and includes a pie-chart generator, sine and cosine functions to the language, and some of the object-movement routines in *Director.*

Page Flipper Plus F/X: In addition to offering real-time animation (up to 60 frames per second), the program includes 76 built-in transitions, plus an option which allows you to design unique ones of your own. Along with standard Amiga resolutions, the program supports both HAM and HalfBrite. It is perfect for creating animated logos, cartoons and special effects to spice up your videos. Because of the program's flexible design, you are not restricted to animations which will fit on a single disk—animations can span over several disks.

The program's script language is easy to learn because you can either create scripts with a text editor or simply point and click. I think most users will welcome this dual editing scheme. The novice can use the Workbench-type interface and move to a standard text editor after mastering the complexity of the program.

Because strong colors are so important to eye-catching videos, *Page Flipper Plus F/X* allows you to change palettes as the animation is running.

Fantavision: I really like this program. It uses a point-to-point draw interface similar to those in *MovieSetter* and *Animator,* but I found it easier to use than either of those.

Animation here is so simple you can just create an object in one frame (screen), copy it to another where you can change its shape and relocate it. The program's magic is revealed when these two frames are animated. *Fantavision* will automatically generate all the images needed to animate and provide transition between the two screens. It is easy to make text and objects move, cycle, rotate, enlarge, and disappear as well as add digitized sound effects to any frame. Because of the program's power and easy-to-operate interface, it is no exaggeration to say the average user can create a simple animated sequence (complete with sound effects) in less than 15 minutes. Penny for penny, this may be the biggest software bargain on the shelves today.

As you would expect, the program does have some limitations. While you can load or create bit-mapped images (like IFF pictures created with a paint program) they cannot be altered. Thus IFF pictures are used primarily for backgrounds, although sections of a background can be clipped and moved around the screen just as easily as a standard *Fantavision* format object.

Adding a Third Dimension

Sculpt 3D: This is the grandaddy of Amiga 3D programs. Objects created with it are true ray-traced images. This means that every edge of an object is actually a straight line plotted through dozens, even thousands of points in space. Objects created with this program have a lifelike quality which must be witnessed to be appreciated. Glass images here look like real glass, metal looks like metal, and reflections display exactly what you would expect in a reflection.

Unfortunately, this quality and perfection is paid for with complexity and time. Most novice users complain that *Sculpt 3D* is difficult to master and that final renderings can take hours to complete. By the time you read this, Byte-by-Byte will have released their newest 3D program called *Sculpt-Animate 4D,* which is supposed to address these two complaints. The update is priced at five times the orignal, but if it allows the user to create *Sculpt 3D*-quality images easily and quickly, I suspect plenty of video producers will jump for it.

Turbo Silver 3.0: The interface used in this version of *Turbo Silver* is an improvement over the original. Most users will also welcome the ability to first design a two-dimensional object and then use the program's powerful editing tools to render it in three dimensions. Version 3.0 also allows multiple light sources to illuminate your objects (32,000 to be exact).

The quality rendered here is as good as that created by the existing 3D programs, yet *Turbo Silver* spits them out in a fraction of the time required by other true ray-tracing programs. The people at Impulse are so confident of their program's quality, that they back it with a lifetime warranty and free telephone support. For serious users, the telephone support alone may justify the program's asking price.

Forms In Flight II: The biggest complaint I heard about the original version of this 3D rendering and animation program was that the interface was difficult to master. This update silences some of those complaints although, like all of the 3D products, squeezing out impressive images here requires lots of patience and perseverance.

The program's manual includes a tutorial with plenty of samples which is a great help to first-time users. But this tutorial approach also means you'll have to read the entire book to dig out all the information you'll need to master the program. This version of *Forms In Flight* allows the user to save images as IFF screens as well as *Sculpt* images. Once a solid-modeled image has been rendered, the program allows you to animate, shrink and enlarge as you make it fly around the screen.

VideoScape 3D 2.0: Like most of the video titles, version 2.0 of *VideoScape* is a refined and improved version of the original. Unlike the original program, you don't have to reload an image every time you toggle between the image display and the editing screens. Like *Forms In Flight,* the program uses Phong shading to create ray-traced-like images. Although true ray-tracing (like those done with *Sculpt 3D)* can produce better quality images that *VideoScape*'s, I personally am happy to exchange the difference in quality to gain the greatly decreased rendering time.

This is a powerful program, but creating a 3D image with it is a real challenge. Happily, Aegis didn't leave the user out in the cold. They created an entirely new editor which takes a lot of the sweat out of 3D rendering called *Modeler 3D.*

Modeler 3D: If you are a novice 3D designer, take my advice and start with this program. I haven't seen any 3D package with an interface which could be described as intuitive, but this one comes closest. In addition to allowing the user to view a full-screen display of the image, you can simultaneously draw an object (using any of three different view angles) and open another smaller 3D window to view the effects of your action. By simply clicking around the edges of the small display (you can size it like any other window) you can rotate or size the image for the exact view you want. Once the object is finished, you can save it to disk and reload it to be animated by *VideoScape.* If you own a CAD (Computer-Aided Design) program which supports the *Aegis Draw Plus* format, you can even load those drawings into *Modeler 3D* and render them into three-dimensional objects.

3D Design Disk Series: If you want to use sculpted images in your videos but have neither the patience nor time to create them with one of the programs mentioned, you may want to investigate Antic's *Cyber Design Disk* series. The disks contain three-dimensional objects which are the equivalent of 3D clip art.

Each of the five disks in the series contains different objects like human body parts *(Human Design Disk),* building parts *(Architectural Design Disk* and *Interiors Design Disk),* robot parts *(Microbot Design Disk)* and paraphernalia you might encounter in a science fiction movie *(Future Design Disk).* If you can find the part you need for your video, the time saved by using predesigned art will quickly recover the price of the disk.

InterChange: This little utility lets you load an object created with one 3D program and convert it for use by another. This format-changing trick will be appreciated by anyone who uses more than one 3D program or buys images (created with different programs) from other artists.

Effective Text

From the conversations I've had with different video producers there is one single software demand which has not yet been fully supplied—fonts. And from what I've heard, that demand will probably never be completely filled. This is true because, in an effort to keep ahead of the competition and offer their clients a new image, video producers rely heavily on being able to offer different, sharp-looking fonts.

Ready-to-Use Fonts

Kara Fonts Headlines: When it comes

to video-displayed fonts, the *Kara Fonts Headlines* collection is king. When I asked the two pros about creating professional screen texts, they both jumped on the *Kara Fonts* bandwagon.

Although not restricted to use in video creations, the *Kara* collection of fonts works well here because of their polished, well-defined, three-dimensional appearance. Each font is defined in color and hi-res and displayed in realistic surfaces like granite, chrome and wood.

The only complaint I've heard about the *Kara* selection is that there are only 20 fonts from which to choose. The message video producers have for Kara is, "Please create more fonts!" [*Editor's Note: Kara Computer Graphics has just released* Headlines 2 *and* Subheads.]

Masterpiece Professional Font Collection: For sheer volume, you probably won't find a larger collection of large fonts than this collection from Aronk. Twenty disks are required to store the 110 different fonts which include four disks filled with color fonts, specifically crafted for video use.

Studio Fonts: At this writing, I am aware of only one collection of fonts from InterActive Softworks which were designed specifically for video use. The *Studio Fonts* collection contains 14 different fonts along with some graphics.

Making Your Own Fonts

Font-Works: This is the newest font creation editor to come to the Amiga system. One of its most powerful features is the ability to slice a letter (or any object) out of any IFF picture and then use it to create unique fonts. For those who have enough patience to design their own fonts, this is a good place to start. The program has plenty of options including special effects like outline, rotate and 3D, plus it lets you size and scale fonts (maximum 1024 × 1024 pixels), and includes a healthy selection of drawing tools.

Calligrapher: This font editor has been around for a long time and is where I first turn when I want to tweak a little change in an existing font. Like *Font-Works* it has plenty of options and editing tools and supports color fonts.

InterFont: If you want to create titles which can rotate and move through space like the images created by a 3D program, you'll want to consider *InterFont*. With it you can create fonts (or small objects, like a company's logo) which can be used to type lines of 3D images. Then you can load those lines into a program like *VideoScape 3D* or *Turbo Silver* and move and animate them just like any standard sculpted object. Like the other two font editors, *InterFont* is easy to use and allows the use of up to 15 colors.

Finishing Your Video Setup

Digi-View Gold: Digi-View from NewTek has been around for a while, but continues to get better as newer versions of the software are released. To put this combination hardware/software product to work, you'll need a video camera and a well-lit area. Providing you have those two requirements, capturing still images to use in your videos is as simple as point and click. I began using *Digi-View* when I became involved with desktop publishing, but have used the same images (saved as IFF files) to create animated short videos with *Fantavision*. For commercial videos the system's obvious use would be to digitize the logos, symbols, products or personnel your clients want to include in their videos.

Tomorrow's Tools

By the time you read this, *DeluxePaint III* will have been released. This program continues the logical evolution of the Deluxe series by adding animation to *DeluxePaint*'s toolbox of tricks. According to the folks at Electronic Arts, the update will allow the user to stamp a series of images through a multiple number of cells using the brush option. The feature will also allow the user to define a brush, a distance for it to travel (including three dimensions), a rotation and the number of animation frames to draw the movement across. *DeluxePaint III* will also support 64 colors instead of the standard 32.

Photon Paint artists will be happy to know that version 2.0 of this popular paint program has just been released, and it too includes animation capabilities. (Contrary to rumors, the program's creator is not in the Israeli army, and is happily working on Amiga software.)

I had hoped for a chance to look at Antic Software's *Zoetrope* before finishing this sidebar, but the review copy promised me was apparently lost in transit. If only half the hoopla surrounding this one is true, it should be a program worth investigating. Those of you who were lucky enough to attend the Super Bowl are already familiar with the quality of animated effects *Zoetrope* packs, since most of the animations dispalyed on the stadium scoreboards were created with *Zoetrope*.

The program was created by Jim Kent who was primarily responsible for *Aegis Animator*. Beyond being an impressive cel animator, artists who use more than one graphic program will be happy to know that *Zoetrope* supports not only the IFF standard, but also accepts images created with *VideoScape 3D, Video Titler* and *Animator*.

Two other programs which will be welcomed by the video producer should be on the market by the time you read this. One is called *Onion* and the other *LightBox*. As I understand them, both programs are designed to help the artist quickly sketch and adjust sequences of animation before rendering the final, full-color image. If they perform as promised, both will help the video developer create animation sequences quicker and with more professional results.

True 3D

I can't close without mentioning one hardware item: X-Specs 3D, which truly impressed me. These electronic glasses wrap a three-dimensional world around you which is so true to life that you can all but touch it. I've never been a fan of 3D videos or movies. Until trying X-Specs 3D I viewed three-dimensional creations as simply curious images and nothing more. But when viewed through these glasses the images look as real as life itself.

When I demonstrated a pair at a user group meeting everyone howled with delight. Since only one person could view the animation at a time (the interface allows a maximum of two glasses to be used per computer), everyone else had to wait his turn. But that didn't keep the crowd from enjoying the demo. What kept them laughing was the futile attempts of the person wearing the glasses to palm a pair of animated cubes as they projected "out beyond the monitor." The 3D illusion the glasses produce is so good, it is difficult to believe you can't touch what you see.

All I can say about X-Specs 3D is that they really work. I'm not sure just where they will fit into the future of video production, but anyone who uses them will come away excited about the possibilities. If Haitex can bring the price down to where everyone could afford a pair, I suspect the era of true 3D video production will begin. Several companies have announced products that support X-Specs 3D, most notably, NewTek recently announced that *DigiPaint III* will support them. Jeffery Hall reviewed the glasses in our February 1989 issue. If you didn't get a chance to read it, go back and do so, or better yet get your local Amiga dealer to demonstrate a pair.

Amiga Video Product Information

A-Squared
6114 La Salle Avenue
Suite 236
Oakland, CA 94611
(415) 339-0339

Aegis Development
2210 Wilshire
Suite 277
Santa Monica, CA 90403
(213) 392-9972

Anakin Research
100 Westmore Drive, Unit 11C
Rexdale, Ontario, Canada M9V 5C3
(416) 744-4246

Antic Software
544 Second Street
San Francisco, CA 94107
(415) 957-0886
(800) 234-7001 (orders only)

Arock Computer Software
1306 E. Sunshine
Springfield, MO 65801
(417) 887-7373
(800) 288-2765 (orders only)

Associated Computer Services
2135 E. Sunshine, Suite 106
Springfield, MO 65804
(417) 887-9923

Bassett Geographic
1103 Rudd Avenue
Auburn, AL 36830
(205) 887-9057

Broderbund Software
17 Paul Drive
San Rafael, CA 94903-2101
(415) 492-3500
(800) 521-6263 (orders only)

Brown-Wagh Publishing
16795 Lark Avenue, Suite 210
Los Gatos, CA 95030
(408) 395-3838
(800) 451-0900

Byte-by-Byte
Arboretum Plaza II, Suite 150
9442 Capital of Texas Highway N.
Austin, TX 78759
(512) 343-4357

C Ltd.
723 E. Skinner
Wichita, KS 67211
(316) 267-3807

Cape Fear Teleproductions
605 Dock Street
Wilmington, NC 28401
(919) 762-8028

Charles Voner Designs
61 Clewley Road
Medford, MA 02155
(617) 396-8354

Classic Concepts
P.O. Box 786
Bellingham, WA 98227-0786
(206) 733-8342

Commodore Business Machines, Inc.
1200 Wilson Drive
West Chester, PA 19380
(215) 431-9100

Communications Specialties
89A Cabot Court
Hauppauge, NY 11788
(516) 273-0404

Computer Arts
P.O. Box 529
Opp, AL 36467
(205) 493-6312

Crystal Rose Software
109 S. Los Robles Avenue
Pasadena, CA 91101-2417
(818) 795-6664

Designing Minds, Inc.
3006 N. Main
Logan, UT 84321
(801) 752-2501

Digital Creations
2865 Sunrise Blvd.
Suite 103
Rancho Cordova, CA 95742
(916) 344-4825

Discovery Software
163 Conduit St.
Annapolis, MD 21401
(301) 268-9877

Eagle Tree Software
P.O. Box 164
Hopewell, VA 23860
(804) 452-0623

EarthBound Software
P.O. Box 7710
Santa Cruz, CA 95061-7710

Elan Design
P.O. Box 31725
San Francisco, CA 94131
(415) 621-8673

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(415) 571-7171

Escape Sequence, Inc.
P.O. Box 1101
Troy, NY 12180
(518) 274-1547

Finally Technologies
25 Van Ness
San Francisco, CA 94102
(415) 564-5903

Free Spirit Software
P.O. Box 128
58 Noble Street
Kutztown, PA 19530
(215) 683-5609
(800) 552-6777 (orders only)

Glacier Technologies
P.O. Box 1309
Vancouver, WA 98666
(206) 694-1539

Gold Disk
2171 Dunwin Drive, #13
Mississauga, Ontario, Canada L5L 1X2
(416) 828-0913

Haitex Resources
208 Carrollton Park
Suite 1207
Carrollton, TX 75006

Hash Enterprises
2800 E. Evergreen Blvd.
Vancouver, WA 98684
(206) 256-8567

Impulse, Inc.
6870 Shingle Creek Pkwy. #112
Minneapolis, MN 55430
(612) 566-0221

Incognito Software
34518 Warren, Suite 149
Westland, MI 48185
(313) 462-2148

Inkwell Systems
1050-R Pioneer Way
El Cajon, CA 92020
(619) 440-7666
(619) 440-7666

Innovision
P.O. Box 742
Hayward, CA 94543
(415) 538-8355
Video Effects 3D $ Innovision

InterActive Softworks
2521 S. Vista Way, Suite 254
Carlsbad, CA 92008
(619) 434-5327

Kara Computer Graphics
6365 Green Valley Circle
Suite 317
Culver City, CA 90230
(213) 670-0493

Liquid Light
2301 W. 205th Street
Suite 106
Torrance, CA 90501
(213) 618-0274

Magni Systems
9500 SW Gemini Drive
Beaverton, OR 97005
(503) 626-8400
(800) 624-6465

Micro Magic
261 Hamilton Avenue
Suite 320B
Palo Alto, CA 94301
(415) 327-9107

MicroIllusions
P.O. Box 3475
17408 Chatsworth Street
Granada Hills, CA 91344
(818) 360-3715
(800) 522-2041

MicroSearch
9896 Southwest Freeway
Houston, TX 77074
(713) 988-2818

MicroWay
P.O. Box 79
Kingston, MA 02364
(508) 746-7341

Mimetics Corp.
P.O. Box 1560
Cupertino, CA 95014
(408) 741-0117

Mindware International
33 Alliance Blvd., Unit 1
Barrie, Ontario, Canada L4M 5K2
(705) 737-5998

New Horizons Software
P.O. Box 43167
Austin, TX 78745
(512) 329-6215

NewTek
115 W. Crane Street
Topeka, KS 66603
(913) 354-1146
(800) 843-8934 (orders only)

Octree Software
311 W. 43rd Street, Suite 904
New York, NY 10036
(212) 262-3116

Oxxi Inc.
3428 Falcon Avenue
Long Beach, CA 90807
(213) 427-2080

Peterson Enterprises
P.O. Box 614
Milford, NH 03055
(603) 673-4009

Progressive Peripherals & Software
464 Kalamath Street
Denver, CO 80204
(303) 825-4144

R & DL Productions
11-24 46th Avenue 2A
Long Island City, NY 11101
(718) 392-4090

The Right Answers Group
P.O. Box 3699
Torrance, CA 90510
(213) 325-1311

Shereff Systems
15075 SW Koll Pkwy.
Suite G
Beaverton, OR 97006
(503) 626-2022

Silent Software
706 W. Broadway, Suite 202
Glendale, CA 91204
(818) 243-0313

SunRize Industries
3801 Old College Road
Bryan, TX 77801
(409) 846-1311

Syndesis
20 West Street
Wilmington, MA 01887
(508) 657-5585

True Basic, Inc.
39 S. Main Street
Hanover, NH 03755
(603) 643-3882

Unison World
2150 Shattuck Avenue
Suite 902
Berkeley, CA 94704
(415) 848-6670

VidTech International
2822 NW 79th Avenue
Miami, FL 33122
(305) 477-2228

Very Vivid
302-1499 Queen Street W.
Toronto, Ontario, Canada M6R 1A3
(416) 537-7222

NOTE: *Several products perform more than one function (e.g., 3D Modeling and Animation). Please contact the manufacturer for complete product information.*

SOFTWARE

PRODUCT	PRICE	COMPANY	DESCRIPTION
Animation			
Animation: Apprentice 3.2	$295.00	Hash Enterprises	
Animation: Editor	$59.95	Hash Enterprises	
Animation: Effects	$49.95	Hash Enterprises	
Animation: Flipper	$15.95	Hash Enterprises	
Animation: Libraries	$24.95	Hash Enterprises	
Animation: Multiplane	$89.95	Hash Enterprises	
Animation: Rotoscope	$79.95	Hash Enterprises	
Animation: Stand	$49.95	Hash Enterprises	
Animator	$139.95	Aegis Development	
Animotion	$99.95	Finally Technologies	Cel Animation
Fantavision	$59.95	Broderbund Software	Animation program featuring object-oriented drawing tools, digitized sound effects, tweening and transformation.
LightBox "The Drawing Tool for Animators"	$189.00	R & DL Productions	Inbetweening software for creating traditional, hand-drawn character animation.
Mandala	$399.00	Very Vivid	Interactive video/animation/music program.
MovieSetter	$99.95	Gold Disk	Creates 32-color animations with stereo sound. Import IFF graphics or use built-in movie clip files.
Photon Video: Cel Animator	$149.95	MicroIllusions	Professional 2D animation and sound synchronization.
Photon Video: EDLP	$499.95	MicroIllusions	Edit decision list management and transfer tool.
Photon Video: Transport Controller	$299.95	MicroIllusions	Controls video hardware to allow automatic single-frame recording of graphics and animation.
Zoetrope: The Animation System	$139.95	Antic Software	Use as stand-alone paint program or to animate 3D images.
Clip Art			
Aegis Art Pak I	$24.95	Aegis Development	Clip art and animation cels.
Art Companion Volume II-IV	$29.95 each	MicroSearch	Hi-res IFF graphics.
Art Gallery I and II	$29.95 each	Unison World	
Choromap	$51.00	Bassett Geographic	Mapping package; makes basemaps and shows areas shaded according to data values.
Cyber Design Disks	$34.95 each	Antic Software	3D objects/forms; *Architectural Design Disk, Human Design Disk, Interiors Design Disk, Future Design Disk, Microbot Design Disk*
Deluxe Maps Vol. I	$25.00	Computer Arts	U.S. regional/state maps clip art.
Desktop Artist	$29.95	SunRize	200 Pieces of B&W IFF clip art for use with any paint program.
Express Clip Art	$29.95	Brown-Wagh	IFF images.
Graphics Library	$195.00	Associated Computer Services	Maps, backgrounds and symbols.
Impact	$89.95	Aegis Development	Presentation graphics and charts.
Media Line Animation Backgrounds	$39.95	Free Spirit Software	30 different animation backgrounds for use in video presentations.
Object Disk #1	$19.95	Syndesis	Full disk of objects for use with *Sculpt 3D* and *VideoScape 3D*.
Space Station/Orbiter	$69.95	Byte-by-Byte	Disk of 3D objects in *Sculpt* scene file format.
Fonts			
Andre's CalligraFonts (formerly *Newsletter Fonts*)	$46.25	InterActive Softworks	115 desktop publishing fonts for PostScript-compatible or dot matrix printing.
Asha's CalligraFonts	$89.95	InterActive Softworks	Includes Stained Glass, KidsBlox, Bronze, Script.
BoardWalk Font Set	$49.95	C Ltd.	
Borders Font Set	$49.95	C Ltd.	
Business Font Set	$49.95	C Ltd.	
CalligraFonts Series	$46.25-$89.95	InterActive Softworks	Five packages of Amiga Diskfonts/Colorfonts created by professional artists using *Calligrapher*.
Calligrapher 1.05	$129.95	InterActive Softworks	Professional font editor.
Celtic Open Font Set	$49.94	C Ltd.	
Commercial Font Set	$99.95	C Ltd.	
EarthBound Font Collections Vol. 1-3	$15.00 each	EarthBound Software	High-quality Amiga fonts; setup utilities and documentation included.
Fontset 1	$34.95	Gold Disk	Eight type styles.
Font-Works	$99.95	Associated Computer Services	
Headline Font Set	$49.95	C Ltd.	
Jet Set Font Set	$49.95	C Ltd.	

PRODUCT	PRICE	COMPANY	DESCRIPTION
Kara Fonts Headlines	$79.95	Kara Computer Graphics	3-disk set, 10 hi-res, professional-quality dimensional color fonts, 2 sizes each.
Kara Fonts Headlines 2	$69.95	Kara Computer Graphics	2-disk set, 4 hi-res dimensional color fonts, 2-3 sizes each; Chisel Script, Glass, Engraved, Embossed.
Kara Fonts Subheads	$69.95	Kara Computer Graphics	Same as *Headlines* but in two smaller sizes.
Lion's CalligraFonts	$89.95	InterActive Softworks	Four-disk set of 150 Amiga bitmap Diskfonts in sizes from 7-160 points.
Marlin's CalligraFonts (formerly *Studio Fonts*)	$46.25	InterActive Softworks	Includes 17 pre-colored, pre-patterned Colorfonts plus 12 monochrome fonts.
Masterpiece Fonts Vol. 1-5	$59.95 each	Arock Computer Software	About 25 fonts per volume selected from *Masterpiece Professional Font Collection.*
Masterpiece Professional Font Collection	$199.00	Arock Computer Software	20-disk set, 110 fonts; also includes clip art and color fonts.
Media Line Font Disk 1	$34.95	Free Spirit Software	9 bit-mapped fonts for video presentation and DTP.
Media Line Font Disk 2	$34.95	Free Spirit Software	3D fonts for video presentation and desktop publishing.
Novelty CalligraFonts	$69.95	InterActive Softworks	Two-disk set with 14 Amiga Diskfonts and 16 ColorFonts. Ice, Pencil, Skyline, Swisscheese, Jade, Stars & Stripes.
Olde English Font Set	$49.95	C Ltd.	
Professional Font Library	$74.95	Classic Concepts	6-disk set, almost 200 styles, 60 distinct fonts 7-100 lines high; monochrome & multicolor; 85 p. manual; requires 1MB.
ProFonts Vol. I	$34.95	New Horizons	Professional fonts.
ProFonts Vol. II	$34.95	New Horizons	Decorative fonts.
Pyre Script Font Set	$49.95	C Ltd.	
Simple Script Font Set	$49.95	C Ltd.	
StoryBook Capitals 2.0	$29.95	Classic Concepts	2-disk set of large, decorative capitals; brush fonts to liven up graphics; 50-180 lines high in monochrome and color.
Symbols Font Set	$49.95	C Ltd.	
Tate Fonts I	$69.95	Byte-by-Byte	3D fonts for use with *Sculpt-Animate* series; Slot, Tube and Prism.
Tate Fonts II	$69.95	Byte-by-Byte	3D fonts for use with *Sculpt-Animate* series; Bevel, LCD and Premier.
Unity Roman Font Set	$49.95	C Ltd.	
Video & Headline Fonts	$39.95	Classic Concepts	3-disk set; 30 fonts in approx. 80 styles. Especially for video titling, paint programs; requires 1MB (duplicates disks 3-4 of *Pro Font Library*).
Video Visions Series	$24.95 each	Charles Voner Designs	Two-disk volume (or available as sets).
VV1: The Titler			Backdrops/scenery IFF overscan files; full 16 color hi-res; two video fonts included.
VV2: The 3D Animator			3D fantasy/animal objects for *Sculpt 3D, Videoscape 3D* or *3Demon.*
VV3: The 2D Animator			Characters/creations for 2D animations.
VV4: The Videographer			Weddings/occasions for use with wedding productions; borders included.
VV5: The Broadcaster			Business/broadcast parts, backdrops for cable or TV.
VV6: The Educator			History/geography; colorful world maps.
VV7: The Advertiser			Products/symbols for putting logos or product ads together.
Zuma Fonts 1, 2, 3 or 4	$34.95 each	Brown-Wagh	Each volume contains 3 styles with 6 sizes, 2 resolutions.

Fractals

Analytic Art	$59.95	Crystal Rose Software	Produces and processes fractal images with infinite complexity.

Image Processing

Butcher	$37.00	Eagle Tree Software	Will convert between all Amiga display modes, supports overscan.
Diamond	$99.95	Impulse, Inc.	HAM paint program/image processor.
DeluxePhotoLab	$149.95	Electronic Arts	Allows users to create and manipulate photographic-quality images in 8 levels of resolution.
PhotoSynthesis	$149.95	Escape Sequence	Dedicated image-processing program; can store up to five images in its buffer.
PIXmate	$69.95	Progressive Peripherals	Image enhancement software; will perform 3000 special effects on one image.

Paint

Aegis Images	$39.95	Aegis Development	Powerful low-cost paint system.
Amiga Starter Kit	$99.95	Aegis Development	Includes paint program, drawing program, animation program and clip art.
B-Paint	$39.95	Finally Technologies	
Chroma Paint	$49.95	Designing Minds	Fast paint program supports Extra HalfBrite.

PRODUCT	PRICE	COMPANY	DESCRIPTION
DeluxePaint II	$99.00	Electronic Arts	Graphics program with split screen magnify, color gradient fills, color cycling, mirror tile and cyclic symmetry options.
DeluxePaint III	$149.95	Electronic Arts	Upgrade that includes AnimPaint animation program.
Digi-Paint 3	$99.95	NewTek	Advanced HAM, 4096-color paint program, 100% in assembly code for fast response.
Express Paint 3.0	$139.95	Brown-Wagh	Full-featured paint program; any size screen, virtual page, unlimited undo/redo, 3D.
Onion	TBD	Silent Software	
Photon Paint 2.0	$149.95	MicroIllusions	Full-featured second generation HAM paint program with animation and 3D effects.
Spritz	$79.95	Glacier Technologies	Graphics editing and creation tool. Designed for short editing jobs required by video and graphics professionals.

Presentation

PRODUCT	PRICE	COMPANY	DESCRIPTION
ANIMagic	$99.95	Aegis Development	Create special effects like spins, page turns, venetian-blinds.
DeluxeProductions	$199.00	Electronic Arts	Lets users work in overscan and chain productions together; includes 40 special effects, 3 clip art disks.
DeluxeVideo 1.2	$129.95	Electronic Arts	Generates animation and titles; adds music/sound to videos.
The Director	$69.95	Right Answers Group	Manipulates images, text and sound.
Elan Performer	$59.00	Elan Design	Supports variety of Amiga graphics and animation formats for display without disk swapping at the press of a key.
Invision	$199.00	Elan Design	Works with A-Squared's Live! to capture, process and display video effects continuously in real time.
Lights! Camera! Action!	$79.95	Aegis Development	Graphics, animation and music presentation program; includes 40 screen transitions.
PageFlipper	$29.95	Mindware	
PageFlipper Plus F/X	$159.95	Mindware	Full-screen IFF image and special effects program with built-in and custom effects.
PageSync	$100.00	Mindware	Creates timed interaction between graphics and audio; allows external MIDI events and computer animation to control each other.
Station Manager	$3000.00	Associated Computer Services	Includes Amiga hardware and *DeluxeProductions, Weather Graphics Map Generator, Weather-Link*, a graphics library, character generator and teleprompter.
Toolkit	$39.95	Right Answers Group	Adds wipes, pie-chart generator to *The Director*.
*TV*SHOW*	$99.95	Brown-Wagh	Slide show generator; over 50 transitions available.

3D Modeling

PRODUCT	PRICE	COMPANY	DESCRIPTION
Caligari	$249.00	Octree	3D conceptual design and video.
Caligari Professional	$1995.00	Octree	3D conceptual design and video animation (2-4MB rec.).
C-Light	$59.00	Peterson Enterprises	Ray-tracing system for generating 3D pictures/animations with shadows, multiple light sources, and mirror surfaces.
Design 3D	$99.95	Gold Disk	Wire-frame modeling program with six line types and 16 colors; provides four views with four light sources.
Forms in Flight II	$119.00	Micro Magic	3D graphics/animation software; includes surface patches, texture mapping and Phong shading.
Modeler 3D	$99.95	Aegis Development	3D object-generation system with adjustable windows showing top, side and front views of your work.
Opticks	$199.00	Incognito	Full-featured 3D ray-traced rendering; arbitrary resolution; up to 16 million colors.
PageRender 3D	$159.95	Mindware	3D rendering program that combines large object library with support for X-Specs 3D.
Sculpt 3D 2.0	$99.95	Byte-by-Byte	3D modeling and rendering package, includes effects like shadows, reflections and smooth shading.
Sculpt-Animate 4D	$499.95	Byte-by-Byte	Professional 3D design and animation software.
Sculpt-Animate 4D Jr.	$149.95	Byte-by-Byte	Integrated 3D design and animation program.
3Demon	$99.95	Mimetics Unique	WYSIWYG 3D object editor; supports popular rendering pkgs.
3-D Graphics	$49.95	True Basic, Inc.	
Turbo Silver 3.0	$199.00	Impulse, Inc.	Ray-tracing program blends logical user interface with animation capabilities.
VideoScape 3D 2.0	$199.95	Aegis Development	3D animation software, real-time playback in 4096 colors.

Titling

PRODUCT	PRICE	COMPANY	DESCRIPTION
Broadcast Titler	$299.95	Innovision	
Pro Video Plus	$299.95	Shereff Systems	
*TV*TEXT*	$99.95	Brown-Wagh	Titling for video and graphics; colors, fonts, shadows, backgrounds, special effects.
VideoTitler 1.1	$149.95	Aegis Development	With ten fonts and VideoSeg menu-driven slide show program.

PRODUCT	PRICE	COMPANY	DESCRIPTION
Utilities			
Color Splitter	$99.95	SunRize	Electronic color separator for use with *Perfect Vision* and other digitizers that need RGB separation.
Grabbit	$29.95	Discovery Software	Allows user to print screens or save as IFF files.
Forms in Flight Conversion Module	$19.95	Syndesis	Add-on module for *InterChange*.
InterChange	$49.95	Syndesis	Translated file formats between *Sculpt* and *VideoScape 3D*.
InterFont	$119.95	Syndesis	Create 3D object fonts from any Amiga bitmap font. (Available for $79.95 as upgrade to *InterChange*.)
Turbo Silver Conversion Module	$19.95	Syndesis	Add-on module for *InterChange*.
Videotapes			
Color Cycling Animation	$39.95	Cape Fear Teleproductions	Explains Amiga color cycling applications.
Digitizing for Effect	$39.95	Cape Fear Teleproductions	Shows how to capture images with NewTek's DigiView and how to manipulate captured images.
3D Cookbook Video	$24.95	Byte-by-Byte	Introduction to animation on *Sculpt-Animate 4D*.
Video Graphics Techniques	$39.95	Cape Fear Teleproductions	Introduction to Amiga graphics used in video applications.

HARDWARE

PRODUCT	PRICE	COMPANY	DESCRIPTION
Accessories			
Amiga Light Pen and Driver	$129.95	Inkwell Systems	Two-touch switch light pen with transparent driver; supports most Amiga graphics packages.
Digi-Droid	$79.95	NewTek	Facilitates digitizing with Digi-View Gold by turning the filter wheel automatically.
flickerFixer	$595.00	MicroWay	Graphics adaptor; eliminates interlace flicker on the Amiga 2000 and 2500.
X-Specs 3D	$124.95	Haitex Resources	3D glasses.
Genlocks			
Amiga 2300 Genlock	$399.00	Commodore	Internal genlock suitable for non-broadcast use.
AmiGen	$199.95	Mimetics	High-quality, no frills genlock/RGB encoder/keyer.
Color Qube: Genlock/Mixer	TBD	MicroIllusions	Genlocks the Amiga and frame buffer to an external video source and mixes all three images in various combinations.
GEN/ONE	$895.00	Communications Specialties	Professional-quality, full-featured genlock with S-VHS output.
Magni 4004/4004S (NTSC)	$1695.00	Magni Systems	Genlockable video graphics encoder for Amiga 2000, provides fades, keying and RS-170A output. "S" versions also supply S-VHS graphics only output.
Magni 4005/4005S (PAL)	$1865.00	Magni Systems	
Magni 4010 Remote Control	$495.00	Magni Systems	Allows switch control of 4004/4005 fading and keying functions. Also bundled with 4004: $1995 and 4005: $2165
ProGen	$449.95	Progressive Peripherals	Professional-quality genlock for all Amigas. Meets RS-170A standards for broadcast quality.
Scanlock VSL-1 (NTSC)	$995.00	VidTech	Genlock; supports S-VHS.
(PAL)	$1095.00		
SuperGen	$749.00	Digital Creations	Genlock with sliding fade controls, notch filter, broadcast quality, includes software.
SuperGen Gold	$1595.00	Digital Creations	(available July '89) Super VHS genlock, full timability, internal board with external control, includes software.
Graphics Tablets			
AProDraw (12" × 12")	$549.00	R & DL Productions	Summagraphics MM-format graphics tablet with driver and scaling software.
Easyl A500	$399.00	Anakin Research	Pressure-sensitive, allows you to draw with pen or pencil.
Video Digitizers			
Color Qube: Digitizer	TBD	MicroIllusions	Real-time 32,768-color frame grabber; requires Frame Buffer.
Color Qube: Frame Buffer	TBD	MicroIllusions	Displays 32,768 colors in full video overscan.
Digi-View Gold	$199.95	NewTek	Video digitizer captures 2.1 million colors in memory giving you 100,000 apparent colors on screen simultaneously.
Frame Buffer/Frame Capture	$549.95/ $199.95	Mimetics	Professional-quality video image capture and display for full fidelity rendering, paint and image processing applications.
FrameGrabber	$699.95	Progressive Peripherals	Real-time color video digitizer for all Amigas.
FrameGrabber 256	$699.95	Progressive Peripherals	256-gray shade real-time video digitizer.
Live! (A2000)	$450.00	A-Squared	For A500: $399.00 and A1000: $295.00.
Perfect Vision	$249.95	SunRize	Real-time B&W video digitizer; 16 grey scales or 4096 colors.
Video Toaster	$1595.00	NewTek	Real-time, full-color digitizer; real-time digital video effects, frame capture, frame buffer and broadcast-quality genlock.

Inside Q-Link/Welcome to My World

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ware authors from throughout the industry, or even one of the magazine editors or authors like me. There's something going on in the auditorium just about every night.

If you just want to chat or mix it up with good conversation, you might want to wander into one of the rooms in People Connection. There's a menu function that will let you display what public rooms are currently active and how many people are in each room. Typically each room's name will represent what kind of group is using that room or the subject they're discussing. There are also private rooms where people can go to be undisturbed while talking with other users.

Anyone can create his or her own room—it's really very easy. Simply select the menu function to go to a room and then enter the name of the room you want to create. You'll be transported to the room and then you can E-Mail your friends or others to let them know where to meet you. If you want privacy, be sure to use a private room instead of a public room. You might also want to use something unusual for the room name so that others don't accidentally stumble into your private room. Don't forget that if you pick a room name that already exists, you'll enter that room instead of creating a new room.

As I mentioned earlier, People Connection is one of the most active areas on Q-Link. However, keep in mind that PC is a Plus Service and costs you an additional charge for every minute you spend in that part of the system. Some people might consider this expensive, but just compare the cost per minute for using People Connection to the cost of using one of the local telephone chat services. I think you'll find that PC is actually much less than these limited local services.

While touching on the subject of costs, I should mention that new users of online services like Q-Link should check out their expected local telephone charges before signing up for these services. Even though Q-Link and other systems typically absorbed the cost of using Telenet or Tymnet while you're online, there may still be a local telephone charge to access the local input node to these communication services. If you're not located in a highly populated area close to these inputs, be sure to check what the local or long-distance telephone charges might be to access the system. If not, you may be in for a real shock when you get your next telephone bill. The costs can mount up very quickly!

In some cases, you can pay a small monthly charge to your telephone company for some sort of special service that may help reduce or even eliminate any charges for accessing one of the local input nodes. In some parts of the country the telephone companies offer things like Wide Area Calling, Circle Billing or similar services that could turn out to be a real bargain in the long run. In my case, the closest input node is in the next county, and I found that I could cut the telephone charges from 15 cents per minute to only five cents per minute for a fixed charge of less than $3.00 per month. Over the course of a month that adds up to a rather sizable savings for me, so be sure to check the options available in your area.

Guess that's it for another month. I've been told there are a number of new services and features in the works, and several may even be available by the time you read this. I'll have more information in coming columns as Quantum releases details on each new function. As usual, you can reach me via E-Mail to RBAKER on Q-Link or RBAKER PC on PC-Link if you have any comments or suggestions concerning this column.

Letters

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remarkable evasiveness in answering—definitively—the key question: *Who is pirating whom?*

Although my personal computing experience has spanned years and has introduced me to a wide variety of "people" and "hackers," my total experience with pirated software has been—get this—absolutely *none!* I asked around after reading Fields' article and found that almost everyone I know who "hacks," as it were, has the same experience! Oh, there are an awful lot of PD programs and copies of *old, obsolete* programs floating around out there all right—but certainly nothing that very many of us even *wants!* I don't use pirated stuff, my friends don't use it, and we're certainly not complaining because we buy our programs legitimately! Heck, we *like* buying them! So, exactly who is it who *is* complaining so vociferously about this mysterious enigma, the software "pirate"?

Why, goodness gracious and land sakes alive, it's all those poor little, itsy-bitsy software companies themselves who shout, "Pirate, Pirate!" *every time they market a new program and slap a $50 or $60 price tag on it!* Yes, sir, that's who it is, all right.

This whole flap about "pirates" is so similar to just a few years ago when Hollywood took the Sony Corporation to court and claimed that BetaMax VCR's constituted copyright infringement of their products—movies. Hollywood howled to the heavens about how the home VCR was going to destroy the movie industry and about how the "movie pirates" spelled financial ruin for the movie makers. They howled but—thank goodness—nobody listened. They lost their suit. What happened? Well, the movie industry is stronger today than it has been in decades! The horrible things the movie moguls prophesied never happened!

As a result, even though the movie industry was really saturated with organized pirates to a degree not even approached in today's computer software market, consumer prices dropped drastically and consumer access to movies was increased dramatically! In short, absolutely everyone benefitted!

Let me conclude by saying that I do not favor software piracy in any form, nor do I defend it. My considerable library of software is all legitimate, and I'd have it no other way. But Fields' article on software piracy has utterly failed to convince me that such piracy as it *actually exists* constitutes a real threat to the software industry. Rather, I believe these companies benefit from these sorts of dire perceptions.

The truth is that the major software companies in this country have the resources to drive the pirates that *may* exist right out of business. But until they are willing to change their price structures to reflect this goal, they will forever cry "Pirate! Pirate!"

And I, in the reclusive shade of my magnificent Amiga will forever doubt their complete veracity.

Sincerely,
John W. Covington III
Savannah, GA

Editor's Note: *Is the video industry a good parallel to the software industry? If it is, then maybe the software publishers should take a look at Disney.* Cinderella *was recently released for sale at a retail price of $19.95 (although they could have easily charged $49.95 or more). The result? According to the April issue of* Magazine and Bookseller, *about eight million copies have been sold.*

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ing an offensive accruement that becomes a necessity in the later rounds.

While not overwhelming, *Roadwars'* graphics are certainly adequate and effectual, providing a true sense of movement as your vehicle hurls down its course. Striped curbs line each side of the road, helping to sell the illusion as they stream past. All the vehicles and obstacles are well defined and easily recognizable, and move with a realistic flickerless fluidity. (A quick note: the screens depicted on the back of the game box are from a more advanced translation of the contest, *not* the 64 version. What you see is *not* what you get.)

One surprising play element is that your Battlesphere doesn't have an accelerator or brake. When you're cruising, you move at one constant speed: fast . . . no, make that *extremely* fast. And this is the game's appeal or flaw, depending upon your preference. If your trigger finger is in top shape and you possess that uncanny ability to follow three obstacles with two eyes, you won't find a better challenge. Play is fast and fresh, full of all the uncompromising reflex tests that arcaders thrive on. But if either you or your partner fall into the "think-then-act" player category, you may never get out of the starting block. When a killer ball is bearing down, a satellite has locked you in its sights and sparks are flying everywhere, you can't stop and plan. All strategy will have to be decided before the trip begins, or you'll soon be figuring from a stellar scrap heap.

The game's arcade flavor is rounded off with all the desirable extras. Each round is introduced with a scrolling title screen that gives each street its own personality. The audio track accentuates the action with stunning sound effects, and although the vanity board won't let you save high scores to disk, you can keep track of any milestones reached during each sitting.

Roadwars is a thrilling, high-speed challenge that stands as one of the toughest drivers' tests around. ■

Drivers' Assurance You Can Steer Clear of Trouble

Life in this game's fast lane can be short and cruel if you're not familiar with the rules of the road. Read the instruction pamphlet Arcadia provides to familiarize yourself with the enemies' tactics and tendencies. Then look over the tips I've listed below.

They'll help you avoid some of the more common road hazards. Don't be discouraged if it takes some time to get the feel of your vehicle and its weapons. With a little patience and practice, you'll soon be cruising into Armageddon's Hall of Fame.

- If you're off on a solo mission, a computer-controlled Battlesphere partner will join the ready ranks with full armor and impressive firepower. That's the good news. The bad news is that he will also bring along questionable shooting skills, poor target choice and driving tendencies that border on maniacal. At times, the inconsistencies of this computer companion will prove more threatening than anything the enemy can toss your way. I've gotten more cooperation and achieved higher scores working alongside an empty Battlesphere. Try it yourself. Even though you're playing alone, choose the two-player option. The unmanned vehicle will cruise in tandem with yours, even firing whenever you take a shot at the enemy. This consistent, predictable behavior will allow you to concentrate on more important matters—like the enemy.
- For tense arcade action, *Roadwars* really shines as a two-player contest. Here, victory is dependent upon cooperation and communication. Before pushing off down the road, divide the duties.

One player should concentrate on eliminating the charged portions of the guard rail while the other keeps his sights on all of the oncoming road obstacles. Both drivers should also be ready to give verbal "Shields up!" warnings any time the enemy slips through for an unobstructed life-threatening shot at your Battlesphere.

- Collect every bonus road arrow you can possibly get your hands on. The instant increase in firepower that they provide will be an invaluable asset in the later rounds.
- Your computerized foe, as indestructible as he believes himself to be, appears to have a glaring offensive blind spot. As long as you position your Battlesphere just a little over one vehicle's length from either of the outer guard rails, you will remain virtually unnoticed and safe from attack. Most (if not all) of the road obstacles will zip by, coming close but never making impact with your cruiser. The only attackers you will be left to worry about are the killer satellites, which should be picked off on the horizon, long before they have a chance to move up and zero in on your coordinates. This luxury express lane will help to put some of those desirable highway miles on your Battlesphere.

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and best of all there's little difference between the two.

This game breaks new ground in the computer gaming field, and will go down in history as the first ever cartoon-quality game for any computer system! If you loved *Dragon's Lair* in the arcade, or wish to own the most awe-inspiring game ever produced for the Amiga, then this is definitely the game for you.

Secrets from Dirk

- Always have your sword ready, for *Dragon's Lair* is full of surprises.
- Before you start playing in high-resolution mode, be sure that you have prior experience in the portion of the game you're playing. If you don't, you will find play a little awkward, since the screen is condensed so much.
- Since game play happens so fast and decisions must be made so quickly, don't panic if you get killed. Remember, the game sequences happen exactly the same way over and over again. So the next time you approach that same sequence try something different—it just might surprise you. ■

**Also available for the Commodore 64.*

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into line to fit all the established standards, one other problem slipped through—the first released version of *DeluxePrint II* was not compatible with AmigaDOS 1.3. If you are a 1.2 user and bought an early release of *DeluxePrint II*, you probably haven't noticed any problems, since it works perfectly with that version of DOS. Electronic Arts (although a bit embarrassed by the slip-up) stopped sales of the program long enough to fix the DOS problem. If your version of *DeluxePrint II* will not work with AmigaDOS 1.3, contact EA for a free update which is compatible with both 1.2 and 1.3.

Conclusion

Because of it's improvements and enhancements, *DeluxePrint II* is a worthy and welcome successor to *DeluxePrint*. It is even easier to use than the original program, has more options, is logically designed and produces quality printouts. Computers were meant to be used as tools, and *DeluxePrint II* turns the Amiga into a very useful one. Most users will be pleased with the powerful and flexible print shop this programs hangs to the tail of your mouse. ■

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will be spent trying to stay alive, exploring the game world, and collecting and finding the use for all of the objects. If you can do these three things effectively, you will win the game. As an extra challenge, choose an adventurer of a different nationality and try to find out his key item. If you already know how to finish the game, you can try to get higher scores each time you play. Staying alive will be tough until you find out who your enemies are. You don't really need to draw a game map because the game world is not that complicated (and for another reason that I'll mention later). Your biggest problem will be finding out what each object does and when to use it. You'll be doing a lot of "thinking," both as an adventurer in the game and as the human player who is guiding that adventurer.

I've already mentioned the graphics (par excellence), so let's talk about music and sounds. In addition to using the graphics of the Amiga well, *Cosmic Relief* attempts to push the sound chips inside the machine beyond the normal amount of use that you see in games. There is always exciting and intense music going on in the background, and the sounds are realistic and comical. As for using the capabilities of the Amiga, *Cosmic Relief* tries hard and succeeds. The Commodore 64 version of the game does as much as possible with the capabilities of that machine, as well.

The final things I want to discuss are the inclusions and game package. Along with the game manual, you get a copy of the farewell letter written by Professor Renegade to the people of Earth 40 years ago and a sealed clue sheet/map. The clue sheet has a complete map of the game world and Professor Renegade's hideaway, a list of the items and what they're for, and a list of the adventurers and their key items.

Although the sheet tells all, it is not specific as to when and where the objects are used in the game. If letters or numbers were placed on the map where the objects should be used and where they are found, it would help things out a lot. The only other complaint I have with *Cosmic Relief* is that the package looks a little on the dull side, rather cheesy. The game play is flawless and the overall result is a great success. This is the type of game that should spawn a sequel. Until then, switch nationalities and try again. Now go off and save the world!

**Also available for the Commodore 64.*

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mistake—react quickly: "Exactly. That's the best way to draw. Ever tried drawing with the keyboard?"

Most non-users will give up on this tack at this point, but a few will start flailing blindly, saying things like "Yeah, but icons are hard to grab" and "It takes too much time to double-click" and other nonsense. If you're dealing with one of these, go ahead and slap the guy a couple times in the face. He'll thank you for it later when he comes to his senses.

Final Attack: Graphics Interfaces Are Too Slow

We GEOS users cower at the word *slow.* If GEOS has an Achilles heel, this is it. The tendency, when trying to parry such a thrust, is to react wildly, to cover up, to deceive, even to lie about GEOS's true speed.

Don't do it. You have two ways to answer this challenge. Way 1: tell him about the REU. Do this even if you don't have one. Trust me, an REU is more than just a wonderful piece of computer hardware—it's a piece of metal fashioned to fit perfectly over GEOS's heel.

Of course, if your opponent is smart (and if he has any spunk left in him), he'll retort that he doesn't plan to spend any more money on his system. This is the famous Nada-Moola Maneuver. Nothing deflects this as well as the even more famous Gotta-Droola Enticement.

To employ it you must be prepared with at least one really snazzy *geoPaint, geoWrite,* or best of all, *geoPublish* document that you printed out on your dot matrix printer. Better yet, get one done up on a laser printer using one of the many laser printing services. Hold it in front of your opponent's eyes. Speak softly but authoritatively and say: "Can you do this with Speedscript?" (Speedscript, for those new ones amongst us, is a word processor that first appeared as a type-in program in a magazine. Many GEOS-haters are Speedscript users.)

The beauty of the Gotta-Droola Enticement is that it moves you from defense to offense. At this point, it's good to polish him off. The offensive moves are easy to learn, highly effective, and few in number.

Counterpoint: Take This, and That and More

Gotta-Droola is the number one offensive weapon. We simply must show the non-GEOS person the output that we can get with our humble little Commodore systems. He may attempt to defend by saying, "Yeah, I can do some of that with my word processor." It's your turn to snort. Challenge him by saying, "Let me see some." Be assured, he will be quieted.

The next best offensive weapon in your arsenal is the "Boy-does-GEOS-ever-make-good-use-of-the-Commodore-line-up" attack. Tell him how GEOS uses the REU. Report to him how easy it is to have not just two drives on line but even a third RAM disk. Talk a while about how you loaded a 1581 disk with data files. Ask him how much his software makes use of the 1351 mouse. And finally, throw in a few snide comments about printer drivers, concluding with a statement about the huge GEOS family of supported printers as well as up-to-date drivers that do double and even quad strikes.

I assure you, at this point in the duel a body will be on the ground and it won't be yours. But we GEOS people have taken some unfair hits in the past: it's tempting to give a couple kicks to make up for previous wrongs. I sympathize, but don't. Remember, we are trying to convert this heathen, not kill him.

If, by some Rasputin-like freak occurrence, he just won't admit defeat, you should go with the offensive weapon number 3: Product Professionalism. Start with program integration. Ask him if he has any applications that will share data from notepad to spreadsheet to charting to database to paint program to infinity? Then mention all the user support available in magazines (complete columns dedicated to the product) and Q-Link. Finally, dwell on the quality of Berkeley's documentation, possibly the best in the Commodore world. Read aloud from a GEOS manual, referring often to the clarity of the writing and the voluptuous number of illustrations.

We GEOS folks are refined people. After disarming and defeating our foes, we change from fighter to friend. This is the last step in the conversion process. Take him to your house and let him play with GEOS a while. Show him your favorite tricks. Lend him your mouse for a day (well, maybe that's going too far). And be sure to give him information how he can order updates and applications.

If you employ these techniques, you can bet the entire Commodore community will be a-buzz with even more GEOS interest than there already is. You will be famous for having been such a good person, but deep down you and I know your true motives: you wanted more GEOS stuff. Don't tell anyone. Just enjoy Pumping GEOS.

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Atabek, who did *Rings of Ziflin* in 1986, this one takes place in a far more complex and detailed world: six towns and villages, plus ten dungeons that contain a total of 54 levels. There are 25 volunteers from which to choose your party. All are pre-rolled (but you can change your character's name) and ready to rock. I like this form of party creation, since they're all armed and equipped from the outset. The aerial-view maps and ability to converse with characters (by typing in a few words) are reminiscent of the last two *Ultimas*, but *Magic Candle* makes many innovative contributions to the genre.

Well, Isn't that Special?

"Specials" endow this fantasy world with its own personality and charm. There you go, trekking down the road in search of Orcs to slay. Abruptly, the map is replaced with a first-person illustration like those seen in graphic adventures, showing your party halted at a washed-out bridge. Use a rope at this point, and it sails across the chasm; your characters then slide along it to the far side. Other events are often illustrated in this manner, providing a bit of relief from all that delving, slaying and mapping. Graphics are average for such a game: not as detailed as *Questron*, but offering lots of spot animation and finer touches inside towns and so on.

Mapping, however, won't be as much of a problem as in many quests, for you've got auto-mapping in the dungeons. There's also a View command that drops a mini-map of the section of Deruvia in which you're currently lost, stuck or just meandering about. By comparing this with the full-color map that comes with the game, you can quickly get your bearings.

Combat and magic are easy to learn and conduct. there are four books of magic, each with a particular type of spells. (You can find them or buy more books from Wizards in different towns.) Most are the standard attack or defend spells, but Atabek tossed in a few new ones that you'll find as useful as they are unusual: cast Locate, and flashing skulls reveal the location of all nearby monsters; Vision turns a door to glass, so you can see what kind of monsters are inside. Before you can cast a spell, it must be learned in Camp, as in *Pool of Radiance*, but this is more conveniently performed in *Candle*, and not such a pain. For one thing, you can divide the team into several smaller ones (as in *Wasteland*), so the Fighters can explore while Spellcasters learn their spells.

In battle, you'll face several monsters, each represented by its own icon in a simply-illustrated combat area. You direct each party member's actions individually, but the process won't wear you down as in *Pool*—and a battle rarely takes more than a few minutes to resolve. Many actions, such as long-range attack spells, are effectively animated and beefed up with good sound effects. Another novelty is the way your crew and the monsters often jump out of the way to duck a sword or arrow, then move back into their original position.

The interface is among the most powerful and easy to learn that I've seen in an RPG, especially one with so many commands (a total of 44). Rows of options (walk, use, search and so on) appear at the bottom of the screen, similar to the vertical menu of *Questron II*. But when you enter a new location, some of the choices are replaced by new ones. There are three different ways to select a command, and another convenient aspect of this interface is that you don't have to memorize the keystrokes that execute each command. Besides allowing you to save up to four games on a disk, the program enables you to name each one.

For years, I considered originality the most important criterion when reviewing a new title, but I've finally realized that the key factor is really how much *fun* you have playing it. So if it's an epic quest you're seeking, *The Magic Candle*—with its inventive plot (none of this "find and slay an Evil Wizard" business) and numerous innovations—is the light at the end of the tunnel.

Clues of the Month Club

The Magic Candle: Take nfejdjof and qfbsmt into dungeons. Build up Charisma to at least 30 before questing far from Port Avura.

Police Quest II: To disarm the bomb in the plane, search uvscbot and qpdlfut of efbe ijkbdlfst. Open upxfm ejtqfotfs and follow instructions. To get past poison gases in the sewer, quickly go east, then south. Go south again, then west and get the gas mask from the red box.

Might & Magic II: An easy way to earn items and experience: drink from Magic Fountain west of Atlantium to boost abilities to 100, then fly to D-2 and go to 6, 8. Kill Mandagaul, the Court Mage and Bowman for 6500 points, gold and magic items. (To decode clues, count one letter back.)

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right edge of the screen, a double vertical row of icons represents various drawing tools. Using these tools you can create geometric shapes, fill areas and generally draw your images. You also have the ability to load and use standard IFF pictures and brushes.

When you have created a frame, you simply move on to the next until your entire set is created. A "registration mark" option is provided to help you line up all of your frames. Of all the features in *MovieSetter*, the Set Editor is the weakest; its design methodology could have been better. For example, there is no indicator to display how many faces are in a given set or what number face in the series is currently being displayed. If you want to draw an animated figure that completes its movement in ten frames, you have to manually keep track of which frame you are currently drawing. While you can load previously created sets, you cannot load sets saved in standard IFF ANIM format. This makes it very difficult if not impossible to use images created from other sources, such as digitizers.

Finally, it would have been nice if an option were available to allow an image you have drawn to be copied to the next frame in the series automatically. As presently designed, you have to remember to copy the frame to the buffer, advance to the next empty frame, and paste the saved image into the buffer.

The 68-page manual is informative, but like most programs of this type, the only way to learn is by trial and error. The manual does contain some chapters which discuss the principles of animation and offer useful tips. *MovieSetter* includes both a program disk and a clip-art disk containing a nice selection of animated characters. Neither of these disks are copy-protected, and Gold Disk provides a public domain "player" program, so your productions may be freely distributed.

MovieSetter is an easy program to use and provides a simple way of creating animations for video productions. While it is obviously designed primarily for cartoon animations, it can be used for any application that requires moving objects over a background. While SMUS music soundtrack support capabilities would have been nice, the ability to use digitized sound effects enhances the final production. Although I am not an artist by any means, I was able to use *MovieSetter* with existing computer artwork to create some entertaining animations.

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN, RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the "wrong" line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line of more than 80 (or 88) characters.

"[HOME]" = UNSHIFTED CLR/ HOME
"[CLEAR]" = SHIFTED CLR/HOME
"[DOWN]" = CURSOR DOWN
"[UP]" = CURSOR UP
"[RIGHT]" = CURSOR RIGHT
"[LEFT]" = CURSOR LEFT
"[RVS]" = CONTROL 9
"[RVOFF]" = CONTROL 0
"[BLACK]" = CONTROL 1
"[WHITE]" = CONTROL 2
"[RED]" = CONTROL 3
"[CYAN]" = CONTROL 4
"[PURPLE]" = CONTROL 5
"[GREEN]" = CONTROL 6
"[BLUE]" = CONTROL 7
"[YELLOW]" = CONTROL 8
"[ORANGE]" = COMMODORE 1
"[BROWN]" = COMMODORE 2
"[L. RED]" = COMMODORE 3
"[GRAY1]" = COMMODORE 4
"[GRAY2]" = COMMODORE 5
"[L. GREEN]" = COMMODORE 6
"[L. BLUE]" = COMMODORE 7
"[GRAY3]" = COMMODORE 8
"[F1]" = F1
"[F2]" = F2
"[F3]" = F3
"[F4]" = F4
"[F5]" = F5
"[F6]" = F6
"[F7]" = F7
"[F8]" = F8
"[POUND]" = ENGLISH POUND
"[SHFT ^]" = PI SYMBOL
"[^]" = UP ARROW

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running". Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazine
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

Have fun with the programs!

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL [RETURN] on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT..) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

Magazine Entry Program—64

The Magazine Entry Programs are available on disk, along with other programs in this magazine, for $9.95. To order, contact Loadstar at 1-800-831-2694.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>86200 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>59382 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
    1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,98,30,04,C9
1041 DATA 06,30,1E,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
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END

Continued from page 13

The Games: Winter Edition: In the Downhill event, place all four of your cameras in the bottom positions. When you reach them, press the fire button to gain speed for a final rush to the finish line. This should improve your time by five to ten seconds.
SPC Jeff Collins
APO New York, NY

GeeBee Air Rally: To turn fast while keeping a high speed, pull up on the joystick and turn it to the side you want. This is very helpful on the high-skill level boards.
Shazada Williams
Brooklyn, NY

Ghostbusters: Follow these instructions, and you'll close the gate to Zuul: When buying a car, only buy a Compact. Buy only one trap; you'll have to return to Headquarters every time you catch a ghost, but you'll save money. (You have to earn it back to win.)

It is very important *not* to catch any green ghosts after the city's PK energy reaches 1000.

If you wait a while without moving your car or catching any ghosts, a screen will appear with the Marshmallow Man jumping from side to side in front of a door. Take your time and get at least two or three of your men to sneak by him one at a time. Get them inside the door, and you'll win.

The ghost vacuum, PK meter, bait, sensor and so on are just for fun. Don't waste your money on them.

Pressing the spacebar will tell you how many men and empty traps you have and how much power is left in your backpacks.
Dennis Haines
Forked River, NJ

HardBall! The batter can often tell something from the movement of the catcher's mitt in preparation for your pitch. Here's a way to eliminate that movement: After you select your pitch, keep the joystick in the direction you chose (do not let it return to center). When the computer asks you what direction to throw the pitch, just push the fire button.

The catcher's mitt won't move, but the pitch will go in the direction you held the joystick.
Tony Scarlato
Toledo, OH

The Hulk: Can't get past those killer bees? Turn into Hulk and go outside the dome. Find the mesh. Enter Wave Fan, followed by At Mesh. Now you can go back inside the dome and get the wax. Don't bother using the fan on the alien army ants; they just keep coming.

Before entering the underground room that holds the energy egg and bio gem, you must have about nine or ten gems in the "fuzzy area." Then Remember Nightmare for an extra burst of strength. If you Remember Nightmare again, Hulk will become enraged and go out of control. Now Go North, Eat Egg, Scratch Wall and Go Crack.

If you come across the room where the Chief Examiner is behind a desk, *don't move!* Just look around the room at the door, the Chief and his program. Eventually, you should find a gem. If you move or speak before you take it, the Chief will see you and force you back into the computer. If this happens, you probably won't find this room again.
John Shull
Fayetteville, NC

Infiltrator II: Are you tired of bothering with the radio, just to be blown up in the end? Once you've maintained the proper speed and heading, arm your rockets. If you fire a missile as soon as an aircraft comes into view, the aircraft will be destroyed and you can ignore the radio. This also lets you maintain a constant heading, altitude and speed.
Tom Sweetland
Columbus, IN

The Last Ninja: To kill an enemy with a Shuriken, back out of the screen you're in, and enter the last screen you occupied. Use the spacebar to choose the Shuriken, reenter the previous screen. Fire before your enemy has a chance to draw his weapon or to start moving. He will almost always be in the line of the Shuriken's fire.

When you acquire the Sleeping Potion in the Inner Sanctum, use it to put all your enemies to sleep. You can use it indefinitely without it running out. Putting enemies to sleep is easier and faster than using a weapon, doesn't subtract from your hit register, and therefore may save your life to use against the Top Dude.
Contributor Unknown

The Lurking Horror: When you're in the computer room, look at the hacker and get his keys. To get past the floor waxer, do this: (1) Get container, (2) Break glass, (3) Get fire axe, (4) Chop power cord with axe, and (5) Dump container on floor.

Use the forklift in the basement to clear a passageway through the junk.
Michael Sundy
Dayton, OH

Maniac Mansion: When you get the envelope from the safe, there's a better way to open it. Get a Jar of Water and put it and the envelope into the microwave oven in the kitchen. Turn on the microwave. Remove everything when it stops, and notice how easy it is to open the envelope. You'll even be able to use it again.
Gerry Tablada
New Carrollton, MD

Mercenary: Escape from Targ: To get enough money for the Hertz stellar ship, sell your gun, energy crystal and large box. Also sell your neutron fuel, since it is too heavy and you need the anti-grav to pick it up. Sell these items to the Mechanoids, since they offer more money.

Then go to the orbital complex and give them the Mechanoid from the Briefing Room, the 15939 Supply, catering provisions, gold and medical supplies. You now have enough money to win the game.
Jason Landkamer
Broken Arrow, OK

On-Track: Here's a list of the fastest drivers for each track: Monaco—A.J.; Watkins Glen—Mario; Road America—A.J.; Sebring—Mario; Daytona Speedway—Parnelli; Gamestar U.S.A.—Parnelli; Brand's Hatch— A.J.; Mosport—Mario.
Benjamin Hardekopf
Camp Lejeune, NC

Pirates! When the old pirate offers you a treasure map, buy it! It's well worth the 500 gold.

Don't attack a nation that your home country is allied with, as the practice will anger both nations.

Do not wed until you've received all your promotions. They higher your rank, the better your marriage opportunities. But don't forget to make pleasant conversation with all Governor's Daughters; if they like you, they might gather important information at the Governor's Mansion.
Mike & Matt Plittman
Follansbee, WV

Pitstop. When driving a three-lap race, you can sometimes avoid taking a pitstop, thereby finishing with a better time. Just be careful not to ram your tires against the side of the road or against other cars, and keep a steady speed.
Cory Moore
Westlock, Alberta
Canada

Rastan: You must know which symbols do what. Use the high platform when fighting the Castle King. When he is below you, jump off the platform with your sword pointing toward the floor. You'll give him a major stab wound to the head, which should end his reign of terror.
Insane Warrior
Address Unknown

Seventh Fleet: If you play the U.S. side, send the *Missouri* task force to Vladivostok. Before they get there, attack the base with planes from the carriers, then have the *Missouri* bombard the base. You won't have to worry about the badgers or back fires from that base.

Da Nang has some badgers and backfires also, but they should not bother your main fleet.

Deploy your subs in the Sea of Okhotsk by putting them on station at B2, E2, H2, C4, E4, H4, J4 and so on.
David Olson
Langdon, ND

Superstar Ice Hockey: When having a center face-off during a practice game against the computer, push and hold the joystick in the direction you are going. One of three things will happen, and two of them are to your benefit: the computer may check you and get called for a penalty (your advantage); the computer may check you and get away with it (computer's advantage); or you will be able to skate to the goalie untouched, with the goalie jumping out of your way as you move at him. If you push the button just as you touch the net, you'll usually get an easy goal.
Dave Danielson
Brookfield, IL

Test Drive: When the police are chasing you, stay in the left lane. This will keep the cop from getting in front of you and causing a costly collision.

When starting up, it will speed your acceleration if you rev the engine to about 700 rpm before pressing the button. To brake, wait until your rpm is near 400 to downshift.

It is possible to stop a police car by passing another car in the right lane, then putting him between you and the police car.
Steve Yajko
Binghamton, NY

Test Drive: When a policeman pulls in front of you, pass him and speed up. You'll notice that you cannot move, but that your car is steering itself. Other cars pass right through you. In 15 seconds or so, you'll finally stop and get a ticket.
Dan Ledger
Strafford, PA

Times of Lore: Unlike the Dagger, the Magic Axe automatically returns to your hand after each use. It makes combat much easier and faster. To purchase the Magic Axe, go to Lankwell and enter the building in the NNW corner. If no one is home, wait for them to arrive. Upon meeting them, immediately choose the Speak command, and they will offer to sell you the Magic Axe.

To enter Heidric's castle in Ganestor, go to the cellar of that town's inn. On the north wall you'll find a small, barely visible lever. Bump into it, and a secret stairway will be revealed.

The Tablet of Truth is toward the center of the castle's ground floor. Avoid engaging any guards, as you'll need to return here later in the game to speak with Heidric. Before returning the Tablet to the Regent, Use it and choose High King.

The Temple of Angar can only be entered by using the Chime from the dungeon beneath the blasted crater. The key to this dungeon must be obtained from the Archmage in the cottage lying north of the bridge above the Enchanted Forest. Before the Archmage will give it to you, you will need to perform a service for another character in the game.
Dave Gentzler
Thomasville, PA

Wasteland: You're ready to go to Vegas when you have the rank of Specialist or higher, you have at least 17 Carbine, a bulletproof shirt, and some cash.

Go to the Mushroom Church located near the east entrance, and someone will ask you the password. The answer is AZREAL. When they ask you if you have brought a gift, tell them YES and answer BLOODSTUFF. Then you're ready to enter the church.

After entering, go through the hall to the right. Then enter the First Aid Station when you see a blue figure pop up. Go close to it and execute a Battle command. Have one of your men Hire him and have the rest of them Evade. Now you'll have Dr. Mike Scott on your side. With his 5 in Doctor, he's a very good ally to have.
Michael Richardson
Anaheim, CA

Wasteland: The password for Fat Freddy's casino is BIRD. Accept Fat Freddy's offer, but don't kill Faran Brygo. Instead, ask

Gold Mine

Faran what you can do for him. Fat Freddy will give you $1000 on account, even if you never kill Brygo.

In the Stagecoach Inn, avoid entering room #18 until the barmaid gives you the key. To do otherwise means almost certain death.

Save the grazer bat fetish that you find in the museum of the Guardian's Citadel. The Junkmaster will accept it as a gift, and will tell you where to find Base Cochise.

Matt Morrison
Soldotna, AK

Where in the World is Carmen Sandiego? Instead of using the RETURN key and the cursor keys to play, use the joystick in port 2. It's a lot easier and quicker.

Gunter A. Schwandt
Tlalnepantla, Mexico

Zak McKracken: When you first start out in the game, go into your kitchen and get the Butter Knife that is hanging on the wall. When you need extra money in the future, take it to the Buy/Sell Shop on 13th Avenue. The man in the store will buy it from you for $1500!

John Kreps
Grapevine, TX

Zak McKracken: To get the loaf of French bread, ring the bakery doorbell three times.

William Lautzenheiser
Reading, MA

Tips & Tricks

Continued from page 49

pending on their size and complexity. To order or to find a local dealer, call Sams at (800) 428-7267.

Louis F. Sander
Pittsburgh, PA

The "Don't Do It" Key: How many times have you typed halfway through a line, only to decide that what you've typed so far is garbage? Well you don't have to delete all those characters before you start over again! All you need do is press the "Don't Do It" key.

Every computer has one of these keys, but it's amazing how many people don't know it. On all Commodore computers except the Amiga, the "Don't Do It" key is the shifted RETURN key. If you press it while the cursor is on a line, the cursor will jump to the start of the next line, but the computer will not process what was on the original line.

The Amiga's "Don't Do It" key is CTRL X.

Jim Butterfield
Toronto, Ontario
Canada

Classified Ads Save Money: Many newspapers have a classified advertising category for computer equipment. In the Pittsburgh Press, for example, classification 483A is Personal Computers, Games & Accessories. On a typical weekday, it has 15–20 computer ads, almost always including secondhand Commodore equipment.

Timmy Jacobs
Pittsburgh, PA

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